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OUR AUTHORS



Major General Herman Feldman has been The Quartermaster General since 21 March 1949. He is a graduate of the Field Artillery School, the Quartermaster School, and the Industrial College. In June 1942, he became ACOFS, G4, SOS, ETOUSA. Subsequently, he was assigned as ACOFS, G4, SOS, MTOUSA, and CO, Central District, Hq, NATOUSA. Returning to the US in 1943, he was named Deputy QMG for Supply and Planning. In October 1944, he was named Executive Assistant to the ACOFS for Logistics, CINCPA. Since his return to the US in 1945, he held the following assignments until his nomination as QMG: Director, Storage and Distribution Div, OQMG (1945); and Chief, Supply Div, OQMG (1946).

Colonel Orlando C. Troxel, Jr., served during World War II as G3, 4th Inf Div, and G3, VII Corps. After the War he served on the Joint Operations Review Board, and later as a director at the Armed Forces Information School. Prior to assignment as an instructor at the CGSC in July 1950, he served as EO, 3d Div Arty, at Fort Benning, Georgia.

Lieutenant Colonel Donald T. Kellett is the author of "A Modern Infantry Division" which appeared in the May issue of the *MILITARY REVIEW*, together with a biographical sketch of him. He was appointed an instructor at the CGSC in 1950.

Lieutenant Colonel Charles J. Denholm has been an instructor at the CGSC since June 1949. In September 1950, the *MILITARY REVIEW* published his article "Train-

ing Support," in which issue appeared a short biographical sketch of him.

Colonel George C. Reinhardt has been assigned to the CGSC since August 1949. He is the author of "The Logistical Command—Its Origin and Place in Modern Warfare" which appeared in the January 1951 issue of the *MILITARY REVIEW*, together with a biographical sketch of him.

Lieutenant Colonel Raymond H. Knapp, in January 1941, was ordered to the Philippines where he served with the 12th QM Regt, Philippine Div (PS). Captured and held prisoner by the Japanese for 34 months, he was rescued in 1945. On returning to the US, he attended the QM School and the TC School. He was selected as an instructor at the CGSC upon graduation from that College in 1950.

Lieutenant Colonel Millard G. Gray has been an instructor at the CGSC since 1948. He is the author of "The Department of Logistics" which appeared in the March 1950 issue of the *MILITARY REVIEW*, together with a brief biographical sketch of him.

Colonel Harrison Shaler has been Deputy President, The Ordnance Board, since September 1947. In 1942, he arrived in French Morocco as Ammunition Officer, WTF. While overseas, he held the following assignments: DCOFS, G4, and COFS, ABS; Deputy Ordnance Officer and then COFS, PBS; Chief, US Element, Allied High Commission, Austria; and Assistant Deputy US High Commissioner, Austria.

Logistic Support for the Unified Command and Overseas Theater

Major General Herman Feldman, USA
The Quartermaster General

This paper was presented to the student body of the Army War College, Fort Leavenworth, Kansas, on 6 February 1951.—The Editor.

I AM glad of the opportunity to talk to you about my experience with the logistics staff of a unified command. I am reminded of a story told by a man who was very successful at complex administration.

This man, when asked for the secret on which his success depended, replied: "It depends chiefly on my exercise of *good judgment*." "How did you attain your *good judgment*?" he was asked. "From experience," was the answer. "How did you attain your experience?" he was further questioned. "By analyzing numerous instances of *bad judgment*."

One of the lessons my experience has taught me is that the wastage of matériel or of production effort due to indifferent planning, or the unilateral demands of one agency without consideration of the teamwork necessary from other agencies, no longer has a place in logistics. It is a fatal defect.

To overcome, in part, this fatal defect, joint staff planning for logistics was essential to the far-flung amphibious operations associated with the Pacific Theater.

The great distances in the Pacific, and the relative remoteness of the enemy's homeland from ours, made it necessary to consider each operation a step toward an ultimate goal and not merely an end in itself.

This increased the logistics implications of every operation. Each position captured had to be considered for its impact on the supply or support of successive objectives, and as to whether the logistics support should be confined to the tactical advance or include facilities for the logistics support of future objectives.

Responsibilities for Integrated Planning

The responsibilities for integrated planning of logistics lay with the Logistics Division (J4), in the headquarters of the Commander in Chief, Pacific Ocean Areas (CINCPOA). Specifically, the planning function of the Logistics Division was to determine the support necessary to make operations successful.

This support embraced the activities of all the services to include the furnishing of Quartermaster, Engineer [as well as naval construction battalions (CBs)], Chemical, Ordnance, Signal, and Medical supplies, and both water and land transportation.

The husbanding of our resources depends, in part, on the development of common systems and methods of logistic support which are economical, efficient, and flexible enough to meet the needs of the three services

It also was the function of the Logistics Division to assist the tacticians in the determination as to whether the tactical objectives were sound logistically, whether they could be supported effectively, or whether they could be utilized effectively in support of the grand strategy.

J4 always was consulted, and participated in every plan. Consequently, he constantly had to consider all possible objectives in detail—terrain, hydrography, conditions of wind and weather, and the possibilities of their development in relation to other bases—so that when the tactical situation indicated a movement into an area, plans were formulated for its complete support and maximum utilization.

The considerations and deliberations required to arrive at the "big picture" were accomplished through the use of staff studies. Such studies required the services of:

1. A staff of engineers to consider construction problems.
2. Airmen to consider effective positioning of airfields.
3. Quartermaster personnel to determine the "beans and bullets" required.
4. Army and Marine personnel to determine the service troops necessary to support the combat units.
5. Navy and Transportation Corps personnel to determine port capacities, landing facilities, harbor defenses, and the utilities required.

Thus there were welded together in the J4's office the G4 functions of all the services.

I think a few words on the initial organization of the Office of Assistant Chief of Staff, Logistics, CINCPAC, are in order at this time. You will see from Figure 1 that we had two executive assistants represented in the J4 organization.

One of the assistants was located at Pearl Harbor, and the other, who inci-

dentally was myself, was located at Guam, with the advance headquarters.

In general, the function of the portion of the J4 office at the advance headquarters was advance planning. The function of the portion of the J4 office at Pearl Harbor was the development and implementation of plans, and the supervision of operations.

In the absence of the J4 from advance headquarters, I acted as Assistant Chief of Staff for Logistics and, subsequently, was appointed J4.

During the evolution toward a system of joint logistical planning, numerous difficulties were encountered. Inconsistencies and lack of understanding often hampered complete integration. Many of these handicaps were overcome by the stature of our leaders.

After putting aside service prerogatives, and after much improvisation, most of the problems were solved, and some of the greatest gains in effecting joint logistics plans were attained.

Staff Studies

I would like to enlarge on the staff study idea I remarked about a moment ago. It reflected the complete picture required to accomplish the operation. Its concept was based on the strategic decisions of higher authority. Its tactical implications were based on what the Plans Division considered the forces necessary to capture a position, and then the utilization of that position in further action against the enemy. Its Logistical Annex was based on the data compiled by the Logistics Division to support the operation, develop and defend the positions taken, and to utilize them as a base for future advances.

The Logistical Annex sometimes covered a hundred typewritten pages, and contained charts, maps, and tabulations covering the entire scope of the plan.

One of the most valuable of these tabulations was a "Troop List." This was a

list of the forces—Army, Navy, and Marine Corps—which it was estimated would be required to develop and defend a base to the extent required by the fundamental strategic concept, to furnish a garrison, and to support the elements engaged in offensive operations against the enemy, elements which would be based at the position to be taken. This "Troop List" included:

1. *Engineer troops and CBs* to construct airfields and base facilities, provide potable water and power, improve or develop harbors, and construct or repair and maintain roads.
2. *Transportation Corps troops*, including stevedores, to unload cargoes and distribute them to the points required.
3. *Naval personnel* to operate and control the harbors.
4. *Medical troops* to care for the wounded and sick.
5. *Signal troops* to build, maintain, and operate communications systems.
6. *Army and Navy units* to administer the area and control the civil population.
7. *Infantry, artillery, and air force personnel; naval local defense forces; and air warning personnel* to keep the position, so won, secure from counterattack by the enemy, after the major forces involved in the attack had been deployed to further advances.

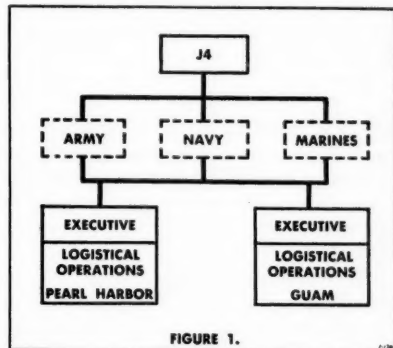
Upon approval of this staff study by higher authority, the mechanics of the procurement of the forces involved could be set in motion. This was done by a directive, issued by CINCPOA, to the subordinate commanders whose function it was to provide, supply, and maintain the forces required.

These commanders included the Commanding General, Pacific Ocean Areas (COMGENPOA), for the Army ground and air forces; the Commanding General, Army Air Forces, Pacific Ocean Areas

(COMGENAAFP OA), for the Army air forces; the Commanding General, Fleet Marine Force, Pacific (COMGENFMF-PAC), for the Marines; Commander, Air Force, Pacific (COMAIRPAC), for the Navy and Marine air forces; and Commander, Service Force, Pacific (COMSERVPAC), for the Navy forces other than air, including the CBs.

This directive set forth the tasks required to accomplish the mission, for the various subordinate commanders, and directed these commanders to procure the necessary troops and matériel, and to prepare their recommendations for the development of the various functions of the objective when captured.

This action could involve reaching back to the primary sources for men and matériel. It also indicated the relative priorities of the developments to be undertaken, and such limitations as the area,



tactical situation, or logistical implications imposed.

Shipping Problem

As a part of the preliminary plans, the huge shipping problem, required by operations in the Pacific, demanded immediate attention. The data on landing facilities in the staff study, which were supplemented constantly by the results of

aerial reconnaissance, showed the limitations which the terrain imposed on unloading cargoes and the consequent development of the base.

It was necessary that shipping be so scheduled as to utilize unloading capacities to their limit; but after a conference with representatives of subordinate commanders, shipping space was allocated by "echelons," with a rendezvous point at Palau, thereby ensuring that no more ships arrived at the target area than could be unloaded completely before another group arrived from the rendezvous point.

This was further complicated by making the necessary space available for support of the forces engaged in the assault, and their supply of food, fuels, and ammunition. From all this data, ships were loaded with personnel and equipment, and so scheduled as to arrive at the target as planned.

Base Development Plan

When the information required from the subordinate commanders had been received in CINCPAC headquarters, the assembly of these recommendations and data was undertaken and a "Base Development Plan" was published. This volume of many pages was a complete tabulation of all the projects and developments which had been approved for inclusion in the facilities of the base.

The "Base Development Plan" reflected the ideas contained in the staff study, the tasks of the directive, and the recommendations of the subordinate commanders whose efforts were to bring it into being.

It should be remembered that this was not an operations plan for an attack—that was a task for others to accomplish. Rather, it was the master plan by which a remote island or area was envisioned as a new base from which to strike the enemy, a base frequently equivalent in population to a large city.

The overseas logistics organization had

to expand, contract, and change location, while remaining more flexible than a similar organization in the continental United States. The overseas organization had to be characterized by decentralization and rapidity of reaction.

Abandonment of Rear Area Bases

One of the most discouraging factors in our Pacific war—and one that required the production and transportation of thousands of tons of extra equipment—was the constant "roll up" and abandonment of rear area bases. These represented, besides the loss of matériel, an irrevocable loss of the effort expended in the construction of piers, warehouses, roads, and other installations.

New forward bases had to be built at a tremendous cost of labor, materials, and shipping. Scores of harbors and island areas, capable of supporting the military effort of the millions of men that were to be deployed against Japan, had to be developed.

Logistical Problems

I have covered the basic organization and operation of the Joint Logistics Division. Now, I would like to relate to you some of the problems which literally became a logistician's nightmare, and which arose in solving the various equations which spelled success in carrying the action to the enemy.

Movements of personnel and matériel naturally presented different types of problems. Personnel are self-loading and can ask questions if lost, but do not always desire to board ships. Matériel is more tractable and, so far as I know, is not subject to changes in morale—but it does not move without assistance.

Let us consider for the moment the logistical problem in the following experience with an operation of the 21st Bomber Command (B-29s):

1. The original plans called for:
 - a. 4 tons per bomb load.

- b. 70 percent of the ships operational.
 - c. 7 missions per month.
 - d. Bombing at 20,000 to 30,000 feet.
2. The new capabilities called for:
- a. 12 tons per bomb load.
 - b. 85 percent of the ships operational.
 - c. 5 missions every 10 days.
 - d. Bombing at 6,000 to 10,000 feet.

After considering all the factors, it was discovered that the new tonnage requirements jumped to 21 times the original estimate. It took a lot of persuasion on the part of the 21st Bomber Command to convince some of us that this was a mere coincidence; that the multiplier of 21 had not been predetermined just for the glamour! However, our satisfaction came from the results, of which Tokyo, Nagoya, and other cities were "burning" examples.

Under the circumstances I've just described, it is evident that the number of aircraft required by the Army and Navy as loss replacements was bewildering. Further, the bomb requirements for incendiaries (napalm and others) were more elusive than any other single commodity.

Some typical statistics for certain other classes of supply are as follows:

Ammunition.—The requirements for one operation were 175,000 tons for the Navy and 166,000 tons for the ground forces, of all types and calibers.

Rations.—One operation required 4,500 tons in the initial movement, with an approximate 3,000 tons a month for maintenance.

Petroleum.—The amount of petroleum supplies was determined in advance by consumption data, as, for example, the per capita consumption figures based on experiences encountered in the South Pacific and Central Pacific since the start of amphibious operations, at Guadalcanal, in August 1942.

Remember that the assembly of data was difficult, and did not flow to us. We were forced to secure it from its source. Thus, we determined about 6 months in

advance: first, the requirements of the forces to be employed; and, second, whether it was possible to meet those requirements.

Armed with the knowledge of the requirements for petroleum products of the ground forces, engineers, air forces, and the fleet, the logistics problem then devolved into the determination of time, manner of delivery, and the necessary installations to effect distribution. The biggest factor in all this was the average "turn-around" of 120 days from the West Coast to CINCPAC.

In comparison, England was only 3,000 miles from the United States with a "turn-around" of between 45 and 60 days.

I would like to draw your attention now to the ease with which we logisticians moved the West Coast of the United States as shown in Figure 2.

Ship "A" represents 200 tankers used to move 10,000,000 barrels of fuel oil for the Navy vessels afloat. Ship "B" represents 65 tankers used to move 3,000,000 gallons of gasoline to shore installations at forward bases. Ship "C" represents Liberty ships moving 500,000 drums of petroleum products to forward bases. Reducing the above data to tonnage figures, the fleet tankers moved 1,200,000 tons of fuel oil; the 65 tankers transported 360,000 tons of gasoline; and the Liberty ships carried 100,000 tons of drummed products.

In the initial stages of an operation, the fuel and Diesel oils were delivered to the advance anchorages of the fleet, where it was transferred to floating storages and into fleet oilers.

These floating storages and fleet oilers were utilized to refuel the ships of the fleet at the anchorages and, when operations were under way, the fleet oilers sustained the fleet at sea by fueling the ships at designated rendezvous points.

During combined operations in the Pacific Ocean Areas in World War II, vast task forces were maintained at sea for periods of from 60 to 90 days, and some

ships even exceeded this length of time.

This feat was made possible by careful planning, well-organized logistic support forces, and the maintenance of control in the sea areas where replenishment occurred.

Specific Questions Answered

When General Swing [Commandant, Army War College] extended the invitation which resulted in my being here this morning, he asked me to express my views on several specific questions.

These questions have been answered before by different people, in different ways, and on different occasions. I am going to give you my unofficial and personal views on this occasion. Before I do, I would like to make clear my basic premise.

We are in the midst of vast changes in concepts concerning all things military. The support arm no longer operates safely behind established front lines. The plane, the guided weapon, the atom bomb, and other tools of warfare have made areas far to the rear a combat zone.

In my opinion, the fundamental consideration we must develop is: How can we best strengthen our striking arm? If we do not meet this issue, first and foremost, we may find our own cities the ports of destination, rather than the ports of embarkation.

Now, to be specific. One of the questions was: "To what degree should each of the three services maintain independent logistic support organizations in a unified command?"

I'll answer the question this way. The National Security Act of 1947 wisely provided for central *policy* control at the level of the Secretary of Defense. Responsibility for *operations* was decentralized to the heads of the three departments.

The decentralization of operating responsibility was both logical and sound when one considers the significant differences and peculiar needs of the three departments. So, too, was the perpetuation

of the logistic support elements common to each of the three departments.

To create an integrated supply organization capable of serving the three departments would have flouted the experience of two world wars, and ignored the essential and significant differences in the operational needs of the three departments.

In my opinion, the complex relationships engendered by the concept of a single supply service would produce such turbulent cross-currents of an explosive nature, as to dwarf the stature of a Kansas "twister," or even the A- or H-bombs. Consequently, I take the position that independent logistic support organizations should be provided or maintained by each of the three departments to the degree practicable.

I am not unmindful that our Nation cannot continue to carry the ever increasing cost of national government, national defense, and international commitments unless the economy is kept strong by the careful husbanding of our resources. For this reason, I consider it essential to have as an objective the development of common items of matériel, and common systems and methods of logistic support which are economical, efficient, and flexible enough to complement and supplement the needs of the three departments, and to enable each department to service the other in an emergency.

Much has been done in this field since unification. Let me give you a few examples:

1. A program to provide uniform procurement regulations is under way. It forms the basis for common and improved practices and procedures.

2. The Quartermaster Corps is responsible for the procurement of food and textiles for the three departments—Army, Navy, and Air Force—except cloth for the distinctive outer garments for the Navy.

3. The joint procurement of petroleum and medical products is an established fact.

4. A military standardization program, to conserve resources and achieve maximum uniformity and interchangeability, is under way.

5. Joint education and training are fostering mutual understanding and teamwork in the true spirit of unification.

Another question raised by General Swing was: "To what degree do the logistics organization and operations of the three departments in the Zone of Interior indicate the logistic organization and methods of operating in a unified command in an overseas theater?"

The answer to this question is self-evident. The same essential and significant differences exist in the operational needs of the three departments overseas as exist in the continental United States. Consequently, the organization for logistics in the Zone of Interior has a most complete bearing on the form the overseas logistic organization takes for the three departments.

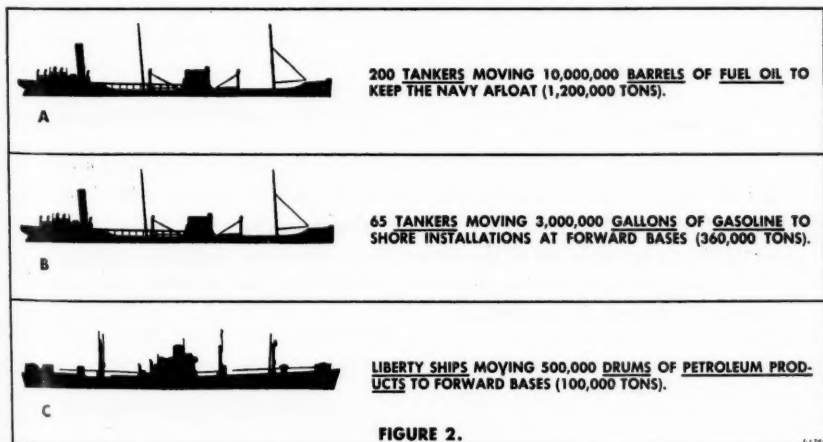
Whether it is in a unified command or

which directed the various subordinate commanders to procure the troops, supplies, and material needed for the operation.

Improvisation does and has taken place. A single service may be given responsibility for providing the logistic support for other services in an operation. For example, the Army has been responsible, in Korea, for providing for the logistic support of the land forces of the United Nations, including the land-based United Nations' air forces, for those common items handled by the Army.

Such action, of course, epitomizes unification at its best, for, when it is applied wisely, it reduces, among other things, duplication and wasteful competition. The ability of our land, sea, and air forces to make the most of their joint strength depends on the knowledge each has of the others' capabilities.

Teamwork, then, becomes more instinctive and less a matter of formal directive.



not, each department maintains its own logistics force. I indicated this to you earlier in my discussion, when I stated that once the J4 had completed the overall joint plan, directives were prepared

There still may be differences of opinion. This is to be expected, for sincere and honest men, with strong loyalties, are bound to have strong views. I believe, however, that after full and forthright

discussion, common decisions will be reached.

Conclusion

I expect that you gentlemen have other questions which you would like to ask me, so I will conclude the formal portion of my remarks at this point. I appreciate the opportunity of being here and talking to you.

My advice to you future policy makers is:

1. Talk and act on a "give-and-take" basis.
2. Recognize the peculiar needs of the three departments.
3. Keep current on unification trends as published in the official documents of the departments and other authentic sources (annual departmental reports).

In the final analysis, the ability to make the most of our joint strength depends on the knowledge each of us has of what the other chap has to do. Therefore, I recommend that you avail yourselves of all opportunities to attend the schools of the three departments, and to otherwise gain as much insight into the problems and operating peculiarities of our sister services as is possible through personal association and the exchange of opinions.

Remember, always, that it is too much to expect that all differences of opinion have or can be resolved quickly, for honest men, with long experiences gained through the years, are bound to have differences of opinion. You can help them reach common decisions by demonstrating understanding and flexibility of mind.

It is the function of logistics to bridge the gap between two normally alien spheres of activity; to make intelligible to the producer the needs of the military commander; and, conversely, to inject into the calculations of the strategist an appreciation of the limits of the materially possible. Logistics is, at once, the military element in the Nation's economy and the economic element in its military operations.

Vice Admiral E. D. Foster

A Corps Advances To Contact

Colonel Orlando C. Troxel, Jr., *Artillery*
Instructor, Command and General Staff College

I CORPS will advance early 12 August from its present concentration area in the vicinity of Glotz to seize This may be the opening maneuver on a new front or new zone of action; it may be the start of a wide turning movement of an enemy flank; or it may be an advance to extend and broaden the present front. The advance to contact is a typical maneuver in the war of movement.

The fundamentals of an advance to contact may be illustrated by considering a corps in an operation of this nature. As the corps may contain all types of troops and weapons, it lends itself particularly well as an example to develop the principal features of an advance to contact in terms of present equipment and organization. Recognizing that a plan for a specific operation will develop from a commander's estimate of the situation, there is a general pattern which characterizes the advance to contact. It is the purpose of this article to present some of the considerations in this pattern.

Let us consider an operational plan for the I Corps. This corps consists of the 1st, 2d, and 3d Infantry Divisions, and

the 4th Armored Division. Included in its corps troops are the 5th Armored Cavalry, containing three reconnaissance battalions; the 6th Armored Group, consisting of three heavy tank battalions; corps artillery; eight truck companies; and other normal components. General "A," commanding the I Corps, has received instructions to move his corps early tomorrow and advance to seize an important objective 150 miles from his present concentration area. His information indicates that an enemy force at least the size of his own, but not as mobile, could engage him before he reaches the objective. At present, his only contact with the enemy is a few patrols which his armored cavalry has located. In brief, General "A" has received his mission, he has the means available to accomplish his mission, and he expects to have the advantage of mobility.

General "A" realizes that his first job is to start his corps moving to the objective. His staff already is preparing maps and data which will assist him in developing his estimate of the situation. In a few minutes, they will report their findings to him. He is thinking over the sev-

Leading elements of an advance to contact must be strong in armor, prepared to drive in or destroy the enemy's security forces. The formation of the main force must be flexible, and as mobile as practicable

eral different ways in which to form his corps for the movement. Let us look into General "A's" mind, and observe his mental processes in this situation.

Width of Front

What width of front should the corps cover in its advance? Should it advance on a wide or narrow front? The advantages of the wide front are strong considerations in arriving at a decision. In the first place, if I ["I" refers to the corps] advance on a broad front, I can determine enemy locations and strengths within a wide zone. Again, a formation of multiple columns provides the depth necessary for great flexibility in lateral and turning movements. This is particularly important in the event that my flanks are attacked. A third advantage is that I will have a greater choice of terrain on which to commit my forces when I meet the enemy. A fourth point is that a broad front requires an initial deployment of forces which not only saves time later on when the troops must be deployed, but permits the adoption of a formation which will give security in the advance. This also permits great flexibility in the further employment of the force.

There are certain cautions which must be observed in adopting a formation on a broad front. The mobility and flexibility of the force are important considerations. If advancing units are too widespread, it may be difficult to mass sufficient strength at a needed point in time to utilize the capabilities of the force. A lack of mobility and flexibility in the leading elements of the force may cause unwarranted delays in the advance if small forces engage the enemy without sufficient means for rapid maneuver and reinforcement. If large units become engaged on a broad front, the more mobile

force can concentrate its power far more quickly than the less mobile.

What about the narrow front? Moving on a narrow front initially will concentrate the effort of the corps. The control of the movement will be simplified. However, there are certain inherent disadvantages to this method of advance. The columns on roads are going to be long in any case, but moving on a narrow front will require the divisions and corps troops in the rear to be far behind the leading elements of the movement. This will reduce the effectiveness of a mobile force due to the time involved in bringing units in the rear to the front. Also, it will cause unnecessary congestion of traffic at critical communication centers and increase the problems of supply. Obstructions to the advance on any single route will delay more troops as more troops are involved on each route.

In general, the use of a narrow front does not exploit the advantages of mobility and flexibility. It limits the maneuverability of the advancing force and may cause a loss of time in the deployment of forces when contact is gained with the enemy. By channeling large forces in a narrow zone, the routes of movement develop some aspects of a defile which is vulnerable to attacks from the flank and presents a profitable target for enemy air attacks.

Effect of Terrain on Width of Front

The exact width of front will have to be determined by a study of the terrain, with particular emphasis on the road net. In addition, my mission and the enemy capabilities are considerations. If the terrain is ideal and consists of gentle slopes and rolling country, possesses good trafficability with a fine road net, and con-

tains no great obstacles, the I Corps could advance on a front of 80 miles or more with its present mobility. On the other hand, a poor road net and difficult terrain obstacles could affect materially the width of the front which should be adopted, particularly if lateral communications were difficult.

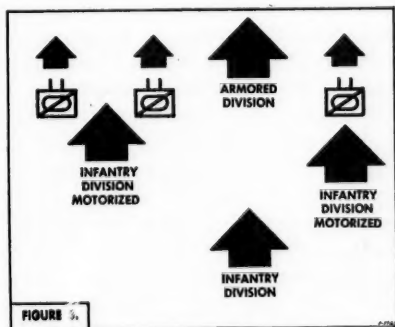
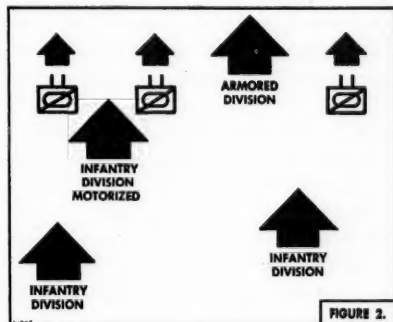
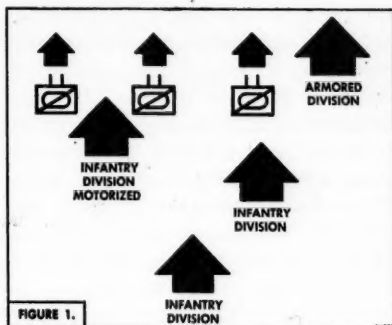
General "A" cannot make a decision at this time, but one thing he will try to do is to advance on as broad a front as his estimate of the situation will permit. He must use his mobility to his greatest advantage.

Covering Force

General "A" next considers the organization of his covering force and its formation for the advance. Considering how little he knows of the conditions under which he will meet the enemy, or what his enemy's tactics will be, he realizes he must be prepared to meet any situation in his movement forward. He knows of certain features which he wants definitely to incorporate in his plan. He wants to move his force forward to the objective as rapidly as possible because speed in the movement will give the enemy less time to prepare to meet him. He wants to locate the main forces of the enemy in his zone. If he can develop the enemy's positions rapidly and in strength, he will keep the initiative. Once he determines the enemy's strength and positions, he wants his corps to be in such a formation that it can launch a co-ordinated attack quickly. General "A" mulls over the capabilities of his infantry divisions, his armored division, his armored cavalry, and the armored group for possible use in an advance covering force.

Historic Examples

Specific cases of corps advancing to con-



Figures 1, 2, and 3 show some variations in the formation of a corps advancing to contact, covering a wide front.

tact during World War II came into General "A's" mind as he considered the capabilities of his units. He recalled the account of the United States VIII Corps, in the Brittany Peninsula, in August 1944. A force of one armored division backed by an infantry division advanced to seal off the 90-mile base of the peninsula, while three main columns moved on Brest. The right column was led by a task force consisting of the VIII Corps cavalry and tank destroyers, followed by motorized infantry. The center and left columns contained the 6th Armored Division marching directly on Brest. The shock action of the leading armor and armored cavalry broke up enemy formations with the result that the peninsula was overrun quickly. The city of Brest was surrounded, and the remaining enemy divisions were cut off from reinforcement and forced into positions which could be taken in relative leisure. The operation was marked by the efficiency and speed with which it was accomplished, and the relatively few casualties to American troops.

A corps advance in southern Belgium illustrated the flexibility and effectiveness of armor and infantry in a meeting engagement developing from a pursuit. The United States VII Corps, pursuing to the east, turned north into Belgium, in September 1944, to cut off German forces attempting to withdraw to the Siegfried Line. The 3d Armored Division spearheaded the advance and was followed closely by the 1st Infantry Division on its left rear and the 9th Infantry Division on its right rear. The 4th Cavalry Group protected the right of the 9th Division and the corps. The 3d Armored Division met elements of a German corps, in the vicinity of Mons, moving laterally across its front to the east. The division

reacted by driving deep into the German formations with armor and infantry, supported by artillery and air column cover. The 1st Division met similar enemy formations, but in less strength, on its left flank. The 9th Division met smaller formations to its front. After a few days of intense fighting, in which the German force was badly mauled, the 1st Division relieved the 3d Armored Division and completed the mopping up of the Mons area. The 9th Division turned east and forced crossings of the Meuse River, south of Namur. The 3d Armored Division moved east from Mons and seized crossings of the Meuse to the east of Namur. On the completion of the mopping up of the Mons area, the 1st Division again took up its position covering the left of the corps. In a period of 7 days, the corps met and annihilated a withdrawing German corps, crossed a formidable obstacle, and continued its movement toward the Siegfried Line. This remarkable achievement was due to the adoption of a flexible formation by the corps, and the shock action of armor closely followed by infantry supported by artillery and air power.

There are many other instances of this type of action during World War II. The rapid advance of the motorized 1st Cavalry Division from Northern Luzon to engage Japanese forces in Manila demonstrated the same principles of an advance to contact. The corps of General Patton's Third Army exemplified the advance of armored divisions followed by infantry divisions, in flexible formations when they swung south of Paris in their advance to the east.

Elements of the Covering Force

In considering the formation for the I Corps, General "A" already has developed some fairly firm ideas about the covering force he will need. He wants a force which

will not be stopped by a few small enemy groups. He wants something that has more strength than the type of unit used to procure information only. He wants the force to be able to overcome small resistance forces and to bypass organized positions if possible. When General "A" meets the enemy, he intends to deny him any choice of maneuver. He will decide what to do about the enemy as the situation develops, and will have some special instructions to give the covering force commander as to how far he should become engaged with the enemy.

The more General "A" thinks about his covering force, the more he feels that his armored division should be its nucleus. If he advances on a broad front, additional troops will have to be attached to the armored division. Otherwise, the combination of armor, infantry, and artillery that gives the armored division its punch is likely to be dissipated on a broad front. If he uses his 6th Armored Group and attaches artillery and perhaps a battalion of infantry to it, he can further attach it to the 4th Armored Division. Then he would have the strength of nearly two armored divisions in the covering force. However, that would commit all of his heavy armor initially. On the other hand, he can attach a tank battalion, a battalion of infantry, and a battalion of artillery to the 5th Armored Cavalry, and that will form a very substantial supplement to the 4th Armored Division. In this manner, he still will retain control of the 6th Armored Group except for one tank battalion. He likes this last idea better. However, if he adopts the idea, he will prescribe some general instructions to the covering force commander as to what part of the zone of advance the 4th Armored Division, as

such, will be employed and where the 5th Armored Cavalry will operate.

In the event that he is forced to advance on a relatively narrow front, probably he will use only the 4th Armored Division in the covering force. He could employ his armored cavalry regiment on either or both flanks. If his advance is along a narrow valley or some other defile, he will want the 5th Armored Cavalry to protect his flanks.

Infantry Division as the Covering Force

General "A" realizes that there could be conditions which might favor the use of an infantry division as an element of the covering force. Terrain which includes rough, mountainous, or heavily forested areas will preclude the use of large quantities of armor and other vehicles in the covering force. An advance to contact in rough terrain necessarily is slow in comparison with an advance in areas where better terrain conditions exist. However, the fundamentals essentially are the same. The covering force should be strong and contain as much armor as can be utilized profitably. The infantry division can be adapted for this purpose. The inherent disadvantages in using an infantry division are its relative lack of mobility, communications, and protected fire power as compared with armored units. Infantry cannot be assembled and regrouped as speedily as armor. When infantry is deployed on a wide front and becomes engaged with the enemy, it is far more difficult for it to disengage from combat and reform in rear areas.

Formation for the Advance of the Remainder of the Corps

With some definite ideas about his covering force, General "A" now is concerned

with the advance of the remainder of the corps. Having eight truck companies, he appreciates that he can motorize one complete infantry division and one regimental combat team of another, or he can motorize two combat teams in each of two divisions. There are several combinations he can use. He also realizes that he may want to motorize an infantry battalion if he attaches it to the armored cavalry regiment in the covering force. In any case, he can have one motorized infantry division maintain close contact with the covering force. This division can clean up any bypassed pockets of resistance or reinforce the covering force when needed. The other two infantry divisions can advance by shuttling, one on either flank, along prescribed routes. The movement of the two rear divisions can be controlled so as to furnish flank protection for the corps and still be ready for employment on the front. The corps troops probably will advance behind the motorized division and between the infantry division moving on each flank. Thus they are prepared to support any action undertaken by the corps.

General "A" considers several other formations which might be adopted by the units in the rear of the covering force. If the front of the corps is very wide, it might be necessary to motorize one infantry division to operate behind the covering force in one zone of advance, and a division with one regimental combat team motorized to operate behind the covering force in the adjacent zone. This will leave the third infantry division to follow by shuttling and be available for use as a reserve. There are other formations which could be adopted, but the final decision will have to be based on his particular needs as they result from his

estimate of the situation. For example, he may have to echelon his rear divisions to one flank or another depending upon the enemy's capabilities.

Air Support

Requests for air support must be sent to army headquarters as soon as possible. He definitely will need fighter bombers to provide close air support to his armor in the covering force. He also will want some fighter bombers to reconnoiter deep in his zone in the direction of the objective. He will request the air force to attack all targets of opportunity provided by the enemy, such as troops on roads, armor, motor columns, artillery positions, and installations. He must not forget to arrange for visual and photographic reconnaissance flights to pick up information of enemy movements which may influence his mission, and which will assist the covering force commander. If he can get enough air support, it will help his advance immeasurably. He particularly hopes that the air force will keep enemy fighters away from his corps.

Control of the Advance

The control of the advance should be fairly simple. General "A" makes a mental note to see that someone on his staff keeps him well posted on the forward progress of the corps. He will require periodic reports every 2 or 3 hours on the location of the leading elements, and he expects personally to see the commanders of the covering force and the follow-up divisions at least once a day. He probably will set a daily march objective. To facilitate control, he may designate one or more phase lines if there are any particular terrain features or obstacles that must be crossed, for which a special co-ordinated effort must be made.

Conclusion

General "A" reviews his thoughts and begins to wonder when his staff will be ready with the maps and the data so he can get started on his estimate. He has refreshed his memory with the fundamental principles and techniques used in conducting an advance to contact. He has decided to advance on a front as broad as the character of the terrain, road net, and the size and mobility of his force will permit. He will set up a strong, mobile covering force with enough punch to drive in any small enemy groups that may try to delay him. He will make certain that there is plenty of armor in the covering force. The formation of the remainder of his corps will be such that at least one motorized infantry division will

follow the covering force closely, to reinforce it as needed, mop up bypassed centers of resistance, or attack through the covering force if ordered. The other divisions of the corps will follow in a formation which will provide for the protection of the flanks as well as be available for quick employment in a coordinated corps attack. He makes a mental note that he will need column cover and reconnaissance as minimum requirements of the air force.

General "A's" chief of staff appears and informs the general that the maps and other data for tomorrow's operation are ready for him in the war room. As General "A" rose quickly, the chief of staff noted that the "old man" had that look of being ready to make his usual quick and sound decisions.

NEXT MONTH

Main Articles

Logistic Limitations on Tactical Decisions by Doctor Roland G. Ruppenthal; and *He That Hath Eyes to See . . .* by Lieutenant Colonel Daniel A. Nolan, Jr., are included among the main articles.

Foreign Military Digests

The foreign digests include "The Transport of Casualties by Air" from the *Journal of the Royal Army Medical Corps* (Great Britain); and "Does Mountainous Terrain Favor Offensive or Defensive Operations?" from *Ejército* (Spain).

Books for the Military Reader

Reviews of *Tito and Goliath* by Hamilton Fish Armstrong; and *The U. S. Marines and Amphibious War* by Jeter A. Isely and Philip A. Crowl are included.

El Guettar

Victory or Stalemate?

Lieutenant Colonel Donald T. Kellett, *Infantry*
Instructor, Command and General Staff College

The views expressed in this article are the author's and are not necessarily those of the Department of the Army, the Army War College, or the Command and General Staff College.—The Editor.

DURING December 1942, General Eisenhower, Commanding General, Allied Forces (North Africa), wrote apropos of operations in Tunisia:

I think the best way to describe our operations to date is that they have violated every recognized principle of war, are in conflict with all operational and logistic methods laid down in text books, and will be condemned in their entirety by all Leavenworth and War College classes for the next 25 years.

That the above-described conditions were to endure, in varying degrees, almost until the conclusion of the Tunisian campaign, is a phenomenon deserving of detailed and separate analysis. Certain factors and circumstances are notable. Troops and commanders largely were inexperienced, the chain of command threaded among several nationalities, and the terrain was difficult and inadequately mapped. Add to these ingredients a deficiency in tactical air support, a long and strained line of supply, and a capable, well-equipped enemy and the justification for mistakes becomes plausible.

Therefore, it is without recrimination that this narrative purports to point out that at El Guettar not only was military doctrine sometimes applied improperly, but that the principles of war were equally violated. These, perhaps, are part of the "growing pains" of a new army, but they

constitute proof that such infractions result inevitably in failure or indecisive achievement.

Particularly suspect was the quality of leadership revealed at all echelons. As stated by one responsible participant: "The action at El Guettar was characterized by hasty decisions and haphazardly executed tactical maneuvers provoked as a result of great pressure on inexperienced unit commanders and green troops by senior general officers."

The Offensive Begins

By 25 March, the II Corps (1st, 9th, and 34th Infantry Divisions; 1st Armored Division; and Corps Troops) had achieved initial successes in Southern Tunisia following the winter reverses suffered at the Faid and Kasserine Passes. Operating directly under General Alexander's 18th Army Group (British 1st and 8th Armies, French XIX Corps, and United States II Corps), General Patton's forces had advanced east and south to the line of critical passes along the Grand Dorsal mountain range. Beyond and perpendicularly lay the flat Tunis Plain, bordering the Mediterranean. Along this north-south strip ran the lines of communications, 200 miles long, to the Axis forces then contesting bitterly the Eighth Army's assault on the Mareth Line.

In his official report, General Alexander wrote as follows:

In view of the development of Eighth Army's battle, I ordered General Patton, late on 22 March, to increase the pressure down the Gafsa—Gabes road with one infantry division and down the Gafsa—

Maknassy road with one armored division. II Corps was to seize and hold the two defiles on these roads, which it was now facing, and operate raiding columns against the enemy's lines of communications.

When those efforts were repulsed successfully by the Axis forces, General Alexander dispatched orders to General Patton, on 25 March, outlining the following operations (see Figure 1):

1. Use the 9th Infantry Division in conjunction with the 1st Infantry Division for an attack on the Gafsa—Gabes axis with a view to opening the pass north of Hill 369 to permit passage of 1st Armored Division; attack 27 or 28 March in three phases:
 - 1st Phase.—Secure the road junction north of Djebel Herda and the hills north and south thereof.
 - 2d Phase.—Secure positions as far forward as the pass between Djebel Chemsi and Djebel ben Krier thereby opening the path for the advance of 1st Armored Division to the vicinity of Djebel Tabaga Fatnassa (west flank of the Wadi Akarit, first enemy delaying position north of the Mareth Line).
 - 3d Phase.—Advance the 1st Armored Division through the pass to the vicinity of Djebel Tabaga Fatnassa (west flank of the Wadi Akarit, first lines of communication of the Germans. (This phase is to be initiated only on the order of the 18th Army Group.)

The remainder of the instructions prescribed the additional employment of a portion of the 1st Armored Division with Combat Team 60 (9th Infantry Division) to operate against the pass east of Maknassy, and the concentration of the 34th Infantry Division in the vicinity of Fondouk (another pass farther north).

While the II Corps, at this time, was deployed on a front exceeding 100 miles, contact was by no means continuous along the Grand Dorsal range. In fact, only four passes, El Guettar, Maknassy, Faid, and Fondouk were considered avenues of approach into the Axis-held area. The intervening terrain, barely negotiable by

the 1st Infantry Division had been heavily engaged in repulsing counterattacks by the German 10th Panzer Division on 23 March. Subsequently, the 1st Infantry Division consolidated its positions.

The Infantry Operations

On 28 March, the 1st and 9th Infantry Divisions launched attacks at daylight, their objectives being the defile at the road junction 10 miles east of El Guettar. The attack had been planned for 270600 March, but was postponed 24 hours because the 9th Division had been given insufficient time for reconnaissance, having moved by motor, on 26 March, from the vicinity of the Kasserine Pass. While neither division was successful immediately, their respective approaches to the problem were radically different.

Whereas the 1st Division was by now considerably acclimated to the Tunisian terrain and the tough and crafty enemy, the 9th Division was entering its first fight as a unit, and even then was minus the 60th Combat Team. The 1st Division at once attempted to gain a foothold on the immediate dominant terrain in its zone, the horseshoe-shaped Djebel McHel-tat (Hill 482). This feature was taken in a pincer movement by two regiments on 29 March. Thereafter, progress, while slow, costly, and difficult, was assured.

After the untried 9th Division moved into its assembly area, it was learned from Lieutenant Colonel Darby, commanding the 1st Ranger Battalion, that he had withdrawn from Hill 772, the key

While the techniques of conducting warfare may vary, the principles of war remain immutable. In order to win battles and achieve decisive results, the doctrine enunciated by those principles should not be violated

the native Arabs and their goats, was not manned by either belligerent.

The II Corps, as directed, concentrated most of its strength at El Guettar where

terrain in the zone pursuant to the orders by Major General Allen, Commanding General, 1st Infantry Division, in order to "straighten the line." Darby pointed out

the vital importance of this hill to Brigadier General Irwin, Commanding General, 9th Infantry Division Artillery, on 27 March. Meanwhile, only partially assembled and denied adequate opportunity for reconnaissance, the 9th Division had attacked in a column of four battalions—straight for the objective, Hill 369.

Before the head of the column came under a withering fire, the last two battalions in line belatedly had deployed in the direction of the dominating high ground on the south flank. Confused and frustrated by the jagged and barren volcanic terrain, these battalions lost direction. One company was ambushed and annihilated in a *cul-de-sac*. Contact with these two units was lost for 36 hours and their locations remained unknown. (At least partially to blame were the small-scale and inaccurate maps. At one time, the Commanding Officer, 47th Infantry, plotted his location 1,000 meters too far forward. Artillery finally was used to determine front-line positions by intersecting flare bursts discharged by the forward elements.)

The two leading battalions of the 47th Infantry had consolidated themselves on a ridge (El Hamra) immediately to the front of the objective. From this position, it was impossible to maneuver by daylight and the entire weight of the enemy's fire poured upon their position.

A Failure Not Redeemed

Subsequently, pressure upon the 9th Division commander having increased, the 2d Battalion, 39th Infantry, was committed in an unhappy gamble. From its reserve position, this unit attempted, on 29 March, a frontal assault under cover of darkness against the precipitous northern slope of the objective. The battalion moved up in trucks and, probably through faulty reconnaissance, was caught by heavy fires from two of the enemy's fortified positions, Hill 290 and Hill 369. Demoralized and disorganized by heavy casualties,

the bulk of the formation withdrew to its original position.

By now, the Eighth Army had outflanked the Mareth Line and entered Gabes. Understandably anxious to prevent the enemy's reorganization in strength upon the line of the Wadi Akarit, General Alexander ordered an element of the 1st Armored Division, the Benson Force (approximately one combat command), to be "launched through the 1st and 9th Infantry Divisions on the morning of 30 March."

The Attempt at Armored Penetration

This decision, undoubtedly, was based upon strategic considerations rather than local tactical conditions. The enemy, at this time, still held firmly the strong positions and the observation on both sides of the El Guettar valley. The desert plain between the converging mountain ranges was covered by mine fields, and well-sited antitank guns, and the considerable opposing armored strength included the tank elements of two armored divisions—the German 10th and the Italian 131st or "Centauro"—supported by tanks of the 501st Heavy Tank Battalion equipped with Mark VI *Tigers*.

The Benson Force attacked at 301200 March, and ran into heavy fire and mines, losing five tanks. At 310600 March, the force again attacked with tanks and the attached infantry of the 3d Battalion, 39th Infantry, which, in a gallant and spirited advance into a veritable hail of fire, captured several hundred prisoners. However, the ground gained could not be held and, by 311245 March, the Benson Force retired with a loss of nine tanks, two tank destroyers, and numerous infantry. Another attempt was made on 1 April without further success. At this point, the 18th Army Group ordered the armored break-through attempt to be withdrawn and the infantry attack resumed to complete the first phase of the operation. Concurrently, puzzling instructions were received to initiate the second phase of the

operation. Since the corps objective—the road junction—remained held securely by the enemy, the seizure of terrain an additional 10 miles beyond the pass, at Hill 369, manifestly was impossible.

Both infantry divisions now continued their attacks. The 9th Division (on the south) still was unable to reach the objective although operations, albeit unsuccessful, were now redirected against Djebel Lettouchi and Hill 772, the dominating ground in the area. During this period, numerous conflicting reports were received that Hill 772 had been seized. However, from the amount of accurate hostile artillery fire delivered deep in the 9th Division zone, it was obvious that the enemy still held observation on the flank. The 1st Infantry Division, meanwhile, gained ground slowly along the parallel ridge north of the road.

The Deadlock

By 3 April, the 1st Infantry Division reached its objective on the north side of the road. The 9th Division continued its bloody attempts to take Hill 772. The enemy commander, the Italian General Messe, on this date, reinforced the El Guettar position with elements of the German 21st Panzer Division, despite the threat of the Eighth Army's build-up before the Wadi Akarit.

Until 6 April, no substantial change in position occurred along the corps front, although offensive operations were not diminished. A peculiar aspect of this period of deadlock was the unexploited capability of the II Corps to turn the enemy defenses straddling the main highway from positions held by the 1st Infantry Division.

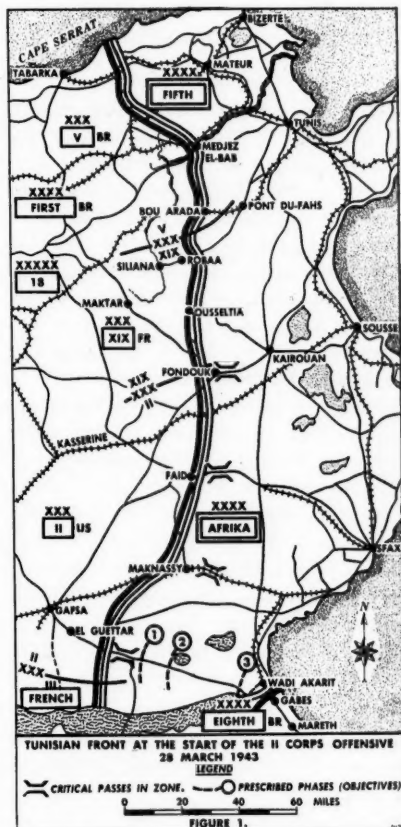
On 6 April, the Eighth Army attacked and overran the Wadi Akarit position. The following morning, against a largely dissipated enemy, the Benson Force broke through the bottleneck and raced 20 miles to the east where, at 071705 April, it contacted patrols of the Eighth Army.

En route, more than 1,000 prisoners were collected. For the II Corps, the battle of El Guettar was over.

Was the operation a success or a stalemate?

The Credit Side

Undoubtedly, the II Corps accomplished



an important portion of its assigned mission—that of applying pressure on the west flank of the enemy deployed against the British Eighth Army.

Despite its inexperience, the II Corps drew off an estimated 37,000 enemy troops,

most of which were engaged at El Guettar. The Eighth Army's success at the Mareth Line was assisted substantially through the containment of the 10th Panzer Division by the 1st Infantry Division on 23 April. And, subsequently, the enemy lost his strong Wadi Akarit position to the Eighth Army while the II Corps drained off at least two panzer divisions.

The Debit Side

However, the II Corps' combat strength at the time of El Guettar (taken from theater records) was 88,473 troops. Some portion of this figure probably was employed in functions assigned normally to army service units. Therefore, the Axis forces may well be credited with withstanding a substantial American corps by employing forces only 40 percent of its size. Moreover, General Messe, the Axis commander in the south, was faced with the tactically hopeless task of containing a co-ordinated attack from the front and from the flank by a considerable array (Eighth Army and II Corps). That his success in preventing a complete Allied break-out into the Tunis Plain, from 20 March until 7 April, was appreciated by his superiors may be attested by his promotion, during the closing days of the Tunisian campaign, to the grade of Field Marshal.

The Major Errors

From the tactician's point of view, the failure of the 9th Infantry Division to seize the dominating ground in its zone was a costly mistake. Not only did the division fail to seize Hill 369, the objective, in the 10 days following, but it sustained casualties estimated at 22 percent of its strength, 95 percent of which were in the infantry.

While the operation plan envisaged that

Hill 772, on the flank, would be seized concurrently with the main frontal attack against the thoroughly fortified division objective, the scheme of maneuver, in effect, bypassed this critical height. Therefore, when the assault on Hill 369 was repulsed, the attacking elements were disposed disadvantageously, with the enemy still established firmly on the flank and rear. In this precarious and harrowing predicament, the division found itself fighting in two directions. This inflexible deployment prevented the reorientation of effort necessary to seize, *first*, the dominating height and, *subsequently*, the objective on lower ground.

Additionally disastrous was the commitment of the Benson Force through a defile still controlled by the enemy. Since the enemy was not deployed thinly, but was well organized and entrenched behind mine fields and an antitank screen, it is inconceivable that such an attack could succeed.

The final tactical enigma is why the II Corps did not break off the frontal attacks by the 9th Division and the Benson Force after 3 April, when the 1st Infantry Division achieved its objective on the north flank of the Axis position. By that time, all three of the infantry regiments of the 1st Division were concentrated along the southeast end of the "horseshoe," with the flank held securely by the 18th Infantry on Hill 574. Certainly the terrain was rough, but apparently the enemy considered it trafficable for armor and had placed extensive mine fields in the area. Doubtlessly, the II Corps must have considered the possibility of an envelopment from the north using the Benson Force and infantry, but no action was ever pursued from this vantage position.

Throughout the battle, the influence of

pressure from higher headquarters was felt keenly. A senior American officer notes the following: "It is my opinion that the hasty commitment of forces piecemeal, the unusual employment of armor, and the disregard of an opportunity for envelopment was the result of pressure from higher headquarters."

An analysis of the principles of war as applied to this situation follows.

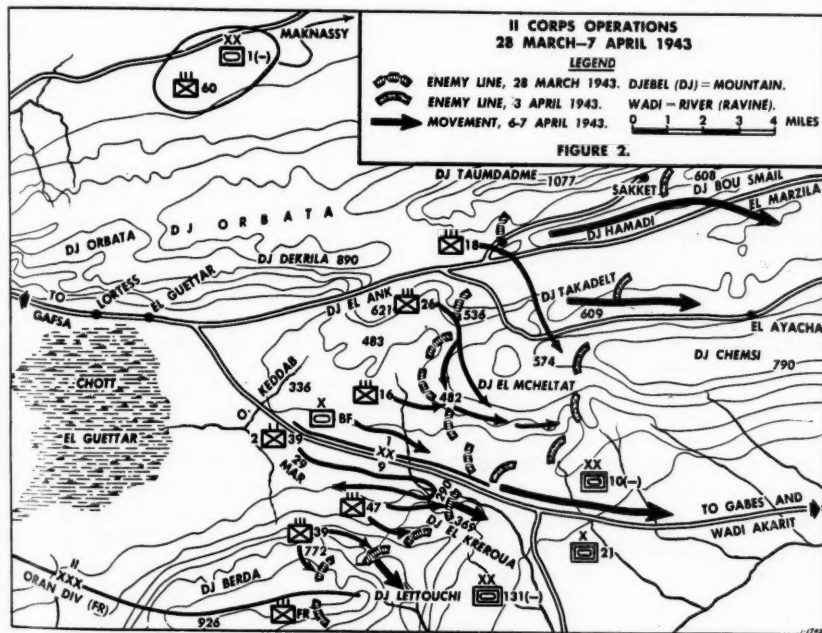
Objective

During the period under consideration, the II Corps was concerned with several

ing distance of each other, an *ad hoc* organization for battle developed which effected profoundly the 9th Infantry and 1st Armored Division, neither of which functioned as a complete unit. The objective within the El Guettar zone (the seizure of the pass and the road junction dominated by Hill 369) was prescribed by higher headquarters and its importance was obvious to all units and commanders concerned.

Simplicity

The plan to seize the objective at El Guettar essentially was simple in con-



objectives. A divergence of effort resulted, wherein break-throughs were attempted both at Maknassy and at El Guettar, while a third effort was planned for the Fondouk area. Since none of these localities were within mutually support-

cept: two infantry divisions were assigned missions of seizing parallel ridges on either side of a defile, while an armored force was to debouch through the bottleneck. In execution, the infantry thrusts did not accomplish the desirable

convergence of effort on Hill 369. Aside from ensuring observation on the north ridge by which the artillery fires of the corps could be massed, the infantry of the 1st Division contributed but little to the convergence of effort upon the corps objective at Hill 369.

Surprise

The combination of enemy tactical air superiority and his control of dominating heights made tactical surprise an impossibility.

Mass

The splitting of the armor between Maknassy and El Guettar may have constituted a violation of this principle. At the small-unit level, however, the peculiarities of terrain precluded an effective application of mass. Particularly in the zone of the 1st Infantry Division, the avenues of approach were confined to sharp ridges along which the infantry filed laboriously in columns. Since the valley was under constant surveillance and was swept with fire, a deployment in strength in any semblance of a skirmish line virtually was impossible.

Maneuver

Maneuver was restricted severely by the terrain, and was confined largely to successive frontal attacks against dominating heights. By failing to secure key hills in its zone, the 9th Infantry Division was hampered severely in its efforts. The 1st Infantry Division was more successful, although no effort was made to capitalize on its outflanking achievement. A change-of-direction thrust south, from the direction of Hill 574 toward Hill 369, could have exploited the limited maneuver capabilities inherent to the situation.

Economy of Force

The dissipation of the II Corps' strength

by diverting large forces to Maknassy already has been mentioned. Probably after the initial break-through opportunity in the Maknassy area had been nullified by the prompt enemy reaction, the forces in that area should have been reduced to a holding effort, and the main effort, at El Guettar, reinforced with the entire 1st Armored Division.

Security

With the 34th Infantry Division in reserve and planning operations against Fondouk, the II Corps' deployment reflected a profound preoccupation with security. The front was long, it is true, but the flanks were covered on either side by the French. The memory of Rommel's raid on the Kasserine Pass and the earlier American reverses undoubtedly occasioned the emphasis of this principle. As the front became stabilized at El Guettar and Maknassy, enemy counterattacks were considered possible and some units even were deployed in defensive positions as late as 4 April.

Offensive

While the units at El Guettar constantly were on the offensive throughout the operation, a lack of co-ordination was evident. Units attacked piecemeal and without apparent consideration of the effect to be gained by a complete convergence of effort. The effect of such sparing enabled the enemy to maneuver behind his line and assemble sufficient forces to contain the individual attacks.

Unity of Command

The influence of the 18th Army Group was manifest throughout the operation, particularly in directing the employment of specific units, notably the Benson Force. Despite the requirement for speedy

assistance to the Eighth Army, the premature commitment of armor into a bottleneck held by the enemy resulted in unnecessary heavy losses before the full weight of the unit could be applied properly.

Epilogue

The American press, long deprived of

triumphant feats of arms by the Americans in Tunisia, hailed El Guettar as a great achievement. But as the II Corps wheeled northward toward the final operation in the Mateur—Bizerte area, a persistent question still rankled the thoughtful:

"Was El Guettar a *victory or stalemate?*"

We seek to use our military strength solely to preserve the peace of the world; for we now know that that is the only sure way to make our freedom secure. That is the basis of the foreign policy of the people of the United States.

President Harry S. Truman

Once the land forces of aggression have moved, it will be too late to countermove by the slow and extended process of creating armies from scratch. If the United States and its friends do not have adequate land forces-in-being and in ready reserve, and the skilled leaders to employ those forces, a future war may be lost before it starts.

Lieutenant General M. S. Eddy

The Independent Corps

Lieutenant Colonel Charles J. Denholm, *Infantry*
Instructor, Command and General Staff College

The MILITARY REVIEW is happy to take this opportunity to present both sides of a subject of vital interest to military thinkers. The rebuttal to Colonel Denholm's article will be found on page 31, in the article "No Matter How You 'Slice' It . . ." by Colonel George C. Reinhardt.

The views expressed in this article are the author's and are not necessarily those of the Department of the Army, the Army War College, or the Command and General Staff College.
—The Editor.

MANY authorities, military and civilian, state that in the next war security from such weapons as the atom bomb will demand smaller and more self-sufficient military units which will result in the elimination of some of the headquarters presently found in the chain of command. One of the most commonly advocated procedures is the use of the independent corps, under army group control, in lieu of our present field army and corps organization.

What is an independent corps? Has the independent corps been used in the past? Should our present field army and corps establishment be replaced by independent corps? In answer to these questions, the following sections, by definition, comparison, example, and discussion, will develop the concept of an independent corps and its use.

Definition

An independent corps is a corps which performs, in addition to its regular tasks, the normal functions of a field army. It usually operates directly under an army group or the theater commander.

Comparison with an Army

An independent corps differs from a field army in only one respect—that the field army, by definition, has two or more corps in the chain of command. Schematically, the command relationships in the two units are as follows:

The corps, in either the field army or when operating independently, has direct tactical control of the divisions attached to it, while the field army exercises broader, more general tactical control over the corps under its jurisdiction. The independent corps must solve not only the same broad tactical and logistical problems which confront the field army but, in addition, must continue to exercise normal direct control over the divisions attached to it.

An independent corps is similar to a field army in that the commanders of both units have the same responsibility for the broad tactical and complete administrative control of their units. The same staff sections and the same type of units, therefore, are required in both organizations. Thus, to change a corps into an independent corps requires a considerable augmentation of its staff, both general and special, as well as the provision of supporting units on the same basis as they

would be provided for an army.* However, fewer total personnel are involved in such administrative support in an independent corps than in a field army, as smaller staff sections and fewer units of all types can support the smaller troop basis.

Comparison with a Corps as Part of a Field Army

An independent corps differs from the corps which is part of a field army in that the commander of a field army corps is responsible for limited service functions and, in general, for tactical plans involving limited periods of time.

The independent corps commander, on the other hand, is responsible for the complete service support of his entire force, and for developing broad tactical plans covering long periods of time. These tactical plans are then checked to see if they are administratively feasible.

This difference in tactical responsibility is emphasized by the fact that the field army, by a series of limited missions to its corps, phases its tactical operations so that they are administratively feasible. The corps, on receiving their orders, know that they have been phased and tested for feasibility. Consequently, the corps

They have little long-range planning to do beyond the successful accomplishment of their immediate mission.

An independent corps' mission is a long-range one, similar to that of a field army. To accomplish its mission, the independent corps has to phase its operations so that its tactical plans are administratively feasible. This requires the selection of suitable intermediate tactical objectives. Once these intermediate objectives are selected and administratively tested, the independent corps can proceed tactically much as a corps which is part of a field army.

Use

In the past, the independent corps was used as an expedient, its most common usage being in island operations which were accomplished by a corps which was not part of a field army. In all cases where this solution was adopted, it was impractical or impossible for the corps to be supplied by a field army.† A few examples of the operations of an independent corps are:

1. The United States II Corps, in North Africa, commanded by General Patton and General Bradley, operated as a large independent corps under the 18th Army

Increased flexibility and a more efficient use of the division slice are goals toward which the Army is striving. The independent corps, an expedient used in World War II, is not the solution to these problems

can devote their activities to the tactical execution of their missions with little concern for administrative considerations.

Group. The II Corps troop list included the following major units:

a. The 1st Armored Division.

* A type field army has 123 different types of supporting units which are not present in a type corps. These units, by branch, occur as follows: Chemical, 7; Engineer, 15; Medical, 33; Ordnance, 14; Quartermaster, 17; Signal, 15; Transportation, 3; and Miscellaneous, 19. In organizing a type independent corps, all 123 of these type units would be required. An example of the type units found in a field army and not in the type corps is found in the following listing of seven Chemical Corps units:

Headquarters and Headquarters Company, Chemical Field Group.

Headquarters and Headquarters Detachment, Chemical Smoke Generator Battalion.

Chemical Smoke Generator Company.
Headquarters and Headquarters Detachment, Chemical Service Battalion (AD).

Chemical Depot Company.
Chemical Maintenance Company.
Chemical Decontamination Company.

† A corps on an independent mission but administratively supported by a field army is not an independent corps. Thus, the VI Corps at Anzio, composed of seven divisions, was on a separate mission, but as it was supplied by the Fifth Army, it does not fall into the category of an independent corps.

b. The 1st, 9th, and 34th Infantry Divisions.

c. 4,000 French combat troops.

d. The 1st Tank Destroyer Group consisting of seven tank destroyer battalions.

e. Necessary combat support and service support units for the combat troops.

During the closing phase of the campaign, this troop list was expanded by the addition of the 3d Infantry Division.

2. The Hollandia operation, in the Pacific Theater, involving the I Corps was an independent corps action. General Eichberger, the corps commander, had both the tactical and logistical responsibility for his corps throughout the entire operation. As planned initially, he was to keep this control for 45 days. The troop list included:

a. The 24th Infantry Division.

b. The 41st Infantry Division.

c. The necessary combat and service support consisting of 167 army units and 67 air force units.

3. In Korea, the United States X Corps was an independent corps during the landing at Inchon and its operations covering the next few months. During this period, General Almond had the complete tactical and logistical responsibility for his corps. This corps was composed of two United States divisions with the proper combat and service support for the initial landing. The corps was expanded later by the addition of other troops.

Future Use

Should we use independent corps as a normal organization to replace the field army and its corps, or should we use it as an expedient as we have in the past? In answer to these questions, we will consider the advantages and disadvantages of using the independent corps to replace the field army.

The advantages of using an independent corps are:

1. The elimination of a headquarters from the chain of command.

2. The establishment of self-sufficient units smaller than the present field army.

3. The establishment of a greater number of self-sufficient commands even though the total number of commands have been cut.

These advantages are all valid and desirable, whether the next war is fought with new weapons or the weapons of World War II.

The elimination of a headquarters from the chain of command permits more rapid and more accurate dissemination of orders to lower units, and provides higher headquarters with a more accurate and complete picture of the situation.

The establishment of self-sufficient units smaller than the present field army makes the dispersion of administrative support against atomic attacks easier, and provides greater security against encirclement by the enemy.

A point often raised in considering independent corps is the limit on their size. The general answer is that the maximum size of an independent corps is determined by the span of control of the corps commander as influenced by:

1. His mission.

2. The duration of the operation.

3. The width and depth of the combat area.

4. The security of his flanks.

5. The principle of simplicity—the ease with which control is maintained.

From past experience, we find that, in the United States Army, each corps had tactical control of an average of four divisions in Europe. However, it was not normal for a corps to have four divisions as some had two or three, whereas others had as many as seven. The number of divisions attached to the corps was determined by its mission. The United States VII Corps furnishes an excellent example of a corps having more than four divisions in major operations. It had seven divisions:

1. During the St. Lô break-out from the

beachhead established by the cross-channel invasion of France.

2. During the encirclement of the Ruhr.

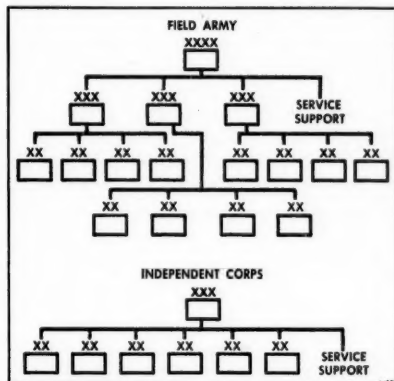
The best example of the maximum span of control exercised by one man is found in the command of the *Afrika Korps* and the Italian Army by General Rommel in his attack commencing 26 May 1942, in Africa. This was the attack which carried Rommel to Egypt. Nominally, Rommel was the supreme commander of the German and Italian forces as well as the commander of the *Afrika Korps*. During this attack, Rommel stayed at the Italian headquarters and personally directed the Italian divisions as well as his corps of three divisions. He, therefore, commanded the equivalent of 11 divisions over a distance of 300 miles.

The major disadvantages of an independent corps, in contrast to a corps which is part of a field army, are the increase in the division slice and the loss of the great flexibility of our present organization.

The first major disadvantage, the increase in the division slice in an independent corps, is occasioned by having a complete administrative organization for each corps instead of an average of one for each three corps (a type field army is composed of three corps) as at present. This increase in the division slice is a serious drawback when one of the prime difficulties expected, in any future war, is a manpower shortage.*

The second major drawback is in the lack of flexibility resulting from having a great number of divisions and a complete administrative organization under a single commander.† Under our present system of having a corps consist of four divisions, with the necessary administrative support provided by the field army, the utmost flex-

ibility is provided. The corps can handle tactically from two to seven divisions with ease, when no administrative considerations are involved. As a result, the corps vary in strength as the situation and the intent of the army commander require. However, were all corps to be organized as independent corps at six or more divisions, little flexibility would be possible. Each corps commander would have his span of control taxed when commanding six divisions together with the necessary administrative support required. In addition, if any shift laterally across a front were involved, the shift of administrative support would be a great prob-



lem. As an example, to form corps of three divisions to be used for exploitation purposes, divisions would be transferred out of an existing independent corps and absorbed by other independent corps. This would give an excess number of divisions to some corps commanders. Further, in the zone of operation and exploitation, the smaller corps would have a complete administrative organization comparable with the other corps in the same area. This

* The number of corps and army troops in a type field army composed of 3 corps and 12 divisions is roughly 195,500, or 16,275 supporting troops for each division. The number of corps troops in a type independent corps of:

a. 4 divisions is roughly 110,000, or 27,500 supporting troops for each division.

b. 6 divisions is roughly 136,000, or 22,666 supporting troops for each division.

† It is assumed that each independent corps will consist of six or more divisions, as the administrative overhead for a corps of five divisions or less would be excessive.

would result in an awkward and inefficient organization. The difficulties involved in varying the size of independent corps would prevent the tailoring of forces to the job—the biggest asset of our present organization.

Considering the pros and cons, it is believed that the increase in the division slice, occasioned by the adoption of the independent corps, and the consequent loss of flexibility, offsets any advantage gained over our present organization. If greater dispersion is required in future wars, it should be based on the improved communications equipment already developed and better administrative support. Better administrative support will result from the more rapid delivery of supplies from the factory to the troops with the elimination of some of the intermediate handling agencies. To gain dispersion by changing our present field army and corps organization is an unnecessary step when it can be gained by increased efficiency alone. If smaller, more self-sufficient units are needed, their creation should be at a level

other than the corps. They can be formed best by reducing the size of units already self-sufficient. Any change which decreases the tactical efficiency resulting from the flexibility of our present organization is a loss rather than a gain.

Summary

Independent corps are corps which are tactically and administratively self-sufficient units. They usually operate directly under an army group or theater.

Independent corps were used in the past and will be used in the future, as expedients. They are used where the scale of the operation does not call for a field army, or where it is inefficient or impractical for a corps to be supplied by an army.

The great loss in flexibility and the increase in the division slice occasioned by the adoption of the independent corps, in lieu of field armies and army corps, should prohibit the adoption of the independent corps as an integral part of the organization of our Army in the future.

If our Army is to be effective to prevent war or to oppose armies superior in men and equipment—as it has twice had to do in Korea and as it may have to do again if war should come elsewhere in the world—then it must have the greatest mobility and fire power that our genius can produce.

General J. Lawton Collins

No Matter How You 'Slice' It . . .

Colonel George C. Reinhardt, *Corps of Engineers*
Instructor, Command and General Staff College

This article is published as a rebuttal to Colonel Denholm's "The Independent Corps" which is found on page 26 of this issue.

The views expressed in this article are the author's and are not necessarily those of the Department of the Army, the Army War College, or the Command and General Staff College.
—The Editor.

THE fascinating pastime of complaining about too many—and too huge—"higher headquarters" matches Mark Twain's definition of the weather. "Everybody gripes about it but nobody ever does anything." Colonel Denholm's able exposition on the independent corps *versus* the field army roused my hopes that here, at last, was someone who *would* do something about this complaint. It was only at the very end of his article, when he used the bogeyman of the division slice to frighten me out of my wits, that I realized he, too, was only complaining, albeit most interestingly.

The invention of the division slice by devoted burners of "Pentagonian" midnight oil, during World War II, was expected to prove a boon to an over-worked planning staff, a sort of military planner's slide rule that provided an-

swers for logistic questions. [Logistics include both G1 and G4 matters, according to the definition found in the *Dictionary of United States Army Terms*, dated August 1950.] Instead, it has developed into a club with which to belabor conscientious logistics planners. Each man who does not actually shoot at the enemy—or, in view of Colonel S. L. A. Marshall's astounding statistics, let us say each man who is not even expected to shoot at the enemy as the normal method of earning his pay—is marked a "drone." Yet those men behind the guns demand all manner of services from the men behind *them*, services that logisticians are now expected to provide *without* using men.

Headquarters or Hindquarters?

Never dreaming of defending (perish the thought) the division slice, might we not, diffidently, ponder as to how much this piling of headquarters upon more headquarters affects it? Is *all* the hateful "fat" far behind the army rear, or can some portion of it have slipped up forward?

Reduced to essentials—never a pleasant procedure—the size of the division slice quickly stands out in direct proportion to the magnitude of services demanded

In analyzing the division slice, differentiation must be made between combat support and service support troops, and as to whether the division slice can be cut in the combat as well as the communications zone

and, in inverse ratio, to the efficiency of the forces providing these services. That rude thought indicates that cutting non-essential services to combat divisions can reduce the division slice just as surely as more productive man-hours achieved by logistic units. Do our combat divisions need all the headquarters that became standing operating procedure in the last War?

General Mark Clark, in his *Calculated Risk*, describes the situation in Italy as "Never were so few commanded by so many." Is Colonel Denholm correct, therefore, in deciding that we cannot spare a single headquarters? Most of those who disagree with him are inexperienced in the problems of high command, but the denunciation by the present Chief, Army Field Forces, carries much more weight.

Which Echelon is 'Excess'?

Consequently, it is not surprising to discover, after some historical research, that somewhat further back than World War II, a Prussian general, named Karl von Clausewitz, wrote vehemently against excess command echelons.

After admitting the benefits [to the high command] of having only three or four subordinates to direct, Von Clausewitz points out that the commander in chief must pay through the nose for that convenience. Not only, as we all recognize, does an order lose force as it passes down through successive "layers" of command, but it is delayed (loss of flexibility), and it is interpreted into something that the commander in chief never intended when he wrote it. Finally, and most important, our guiding precept—unity of command—suffers. Said Von Clausewitz: "The chief loses his own power and efficiency, the wider the spheres of action granted his immediate subordinates."

Of the many reasons for this undeniable phenomenon, Von Clausewitz explained

that "The most important is that each commander looks upon himself as having a kind of proprietary right in his own corps, opposes the withdrawal from him of any portion of it for a longer or shorter time."

It is unfair admittedly to attempt to refute Colonel Denholm with the words of masters, whether living or dead. Doubtless he can introduce numerous other great names to support his contentions. Let us look at the record. Colonel Denholm appends precise figures to his argument. Unless we can beat him with his own data sheet we will surrender—and continue to go through corps when our division wants to reach army.

What is Half of Twelve?

The concept of the independent corps, with its manifest advantages as recounted by Colonel Denholm, appears irrefutable until one reads his footnote covering the essential support of such a corps. There he contrasts a division slice of 34,600 (16,275 plus the "average" division) for the 3-corps, 12-division type field army, against 40,600 for the 6-division independent corps. By his description, that independent corps is, in fact, a field army. Why then is its support so much more costly? Although it contains only half the fighting divisions of the type field army, Colonel Denholm gives it 75 percent (136,000/195,500) of the total support granted the 12-division force. Is that essential?

What has the record to offer? We might note that on page 295 of Field Manual 101-10 *Staff Officers' Field Manual: Organization, Technical, and Logistical Data*, the combat zone division slice is listed at 30,000. We have been told that FM 101-10 is being revised with a view to reducing the division slice totals—but perhaps the planned reductions are all in rear of the army boundary!

A tedious computation of "troop require-

ments, typical army," (Chapter 4, FM 101-10) discloses that 181,600 men in the type field army are not included in its 12 divisions. From this, we can determine a division slice of 33,200—of which 15,100 are corps and army support troops—a total within the 10 percent limit allowable for estimates. This figure trims Colonel Denholm's 16,275 by a slight margin.

At Last a Combat Slice

Neglecting for the moment Colonel Denholm's figures, we discover (in FM 101-10) the following *combat* (though nondivisional) personnel included on the roster of the type field army:

Armored Cavalry	16,800
Infantry	7,500
Chemical Corps (Combat)	3,500
Army Artillery	9,500
Corps Artillery	37,800
Corps Engineers (Combat)	18,600
Army Engineers (Combat)	10,500
TOTAL	104,200

Headquarters assignments and service support then constitute 181,600 minus 104,200, or 77,400. These 77,400 persons are found in the following services:

Chemical Corps	3,000
Engineers	10,000
Medical	13,700
Military Police	3,200
Ordnance	16,000
Quartermaster	11,800
Signal	3,600
Transportation Corps	5,900
Army Headquarters plus 3 Corps Headquarters	10,200
TOTAL	77,400

Dividing the above listed totals by 12 gives us a *combat* support slice of 8,680

and a *service* support increment of 6,450 for each division. Prospects look brighter. Big as it is, our total support slice is made up of at least 58 percent *combat* elements.

It is difficult to conceive why 6 divisions will require more than half the support now accorded to 12. Preserving the "integrity of units" suggests much less than a 10 percent (allowable estimating error) differential after painful computations of the Tables of Organization and Equipment involved. Thus, the six-division establishment should receive 50 percent (not 75 percent) of the support, combat and non-combat, given a type field army.

But this new outfit—let us call it an "army" after the fashion of numerous foreign military establishments—*loses* 3 corps headquarters or 8,600 persons, based on the data in FM 101-10. That reduces the noncombat portion of the division slice to 5,730. No—the "slice" contention will not stand up as a reason for the extra headquarters.

Par is Eight Divisions

If we appeal to history, like the Filly-Do bird who always flew backward because he was greatly concerned over where he had been, we note a British army group in the European Theater of Operations average *two* field armies, of *two* corps each, with *two* divisions in each corps. Clausewitz wrote that an army commander can handle eight divisions. Russian generals did so in their successful counter-offensives. Applied to the British army group, that policy would have eliminated two army and two corps headquarters.

Among strictly American organizations, the United States First Army opened its highly successful drive out of Normandy on 1 August 1944, with three corps headquarters superimposed over eight divisions. Three months later, there were 12 divisions divided among 3 corps, almost the only World War II example of the

"type" field army. In the same month, the United States Ninth Army consisted of two corps and six divisions. United States Third Army figures are omitted as they are not readily available.

The United States Seventh Army began its offensive in Southern France with one corps of three divisions plus a French combat command (armored), but grew to two corps containing eight divisions by December 1944. Its peak was reached in March 1945, when it consisted of 16 divisions, 3 of which were in army reserve, and 3 corps. One of the rare instances of 4 corps in a single field army was the United States First Army in April, which had under command 14 divisions. (The United States V Corps had only one division, with another in army reserve.) The United States VII Corps, always a part of the First Army, achieved a record by commanding six divisions plus a cavalry group in March 1945.

The United States Fifth Army in April 1945, the approximate date of General Clark's epigram, contained two corps and nine divisions. Field armies in the Pacific Theater were smaller than those in Europe, but we must not forget that the European Theater of Operations had three army groups, two American and one British. (The Italian campaign in the Mediterranean Theater of Operations also was controlled by an army group.)

Not Here but There

This galaxy of figures is not intended to hint, much less prove, that the elimination of a corps headquarters and possibly an occasional army group headquarters would save enough personnel so as to decrease sharply the division slice. It might be interesting, however, to research the complete support requirements of such headquarters.

No, any case for the elimination of a headquarters here and there (admitting that "there" and never "here" is the appropriate spot) must rest on much firmer considerations. It might appear that Colonel Denholm submitted these considerations—flexibility, unity of command, and maneuverability—which he presented too ably to require paraphrasing. I merely seek to dispel the bogeyman of the division slice, alleged to stand in the way of his proposal.

It also seemed apropos to check the record and learn that field armies often contained less than the 12-division total allocated the so-called "type field army." Thus, if a six- to eight-division (corps-less) army is practical, we would not have needed any more armies in World War II than we actually had.

Let us accept Colonel Denholm's fine presentation, merely rechecking the data in his footnote which obscures the real issue.

If we are to continue to enjoy the bounties of our democracy, with safety at a minimum cost in time and effort, we must incorporate into our peacetime pursuits those precautions that will permit the fastest possible mobilization—in both manpower and industry.

General J. Lawton Collins

Save--By Palletizing

Lieutenant Colonel Raymond H. Knapp, *Transportation Corps*
Instructor, Command and General Staff College

ONE problem that has bedeviled military commanders in the field as well as high-level military planners is how to get the largest number of fighting troops on the field of battle. In the United States, today, this problem is particularly acute. Experience has shown that for every man fighting in the front lines, we must have six more soldiers and nine more civilians working to support and maintain this "lonely fighter." True, many essential services must be performed to make the combat soldier effective. The idea of activating a modern army in which each man brings his own hunting rifle, bullets and mold, gunpowder, side of bacon, and transportation—a mule or horse—seems and is a little farfetched. We must admit that certain supporting personnel are desirable and necessary. But the amount of such service required and the personnel to provide it is the crux of the matter, for it must be remembered that our ultimate objective still is to get the maximum number of combat effectives on the battlefield.

Just how many combat soldiers should we have available for battlefield duties? Any reasonable estimate must be based on facts. Therefore, we must consider nations antagonistic to our national aims. China, with her population of 500 millions, seems

anything but pro-American as witness her recent actions in Tibet and Korea. A goodly proportion of the estimated 100 million inhabitants of Indo-China and similar areas in the Southwest Pacific seem to have been influenced unduly by the insidious propaganda of the USSR. If we are to lend credence to the opinions of our leaders, the only country or combination of countries powerful enough today to be considered a direct threat to our way of living is the USSR and her satellites.

Comparisons

What are some of the comparisons that can be made between the USSR (excluding her satellites) and the United States? We suffer on the basis of total population, 200 millions to our 150 millions; on manpower within the age bracket considered available for civilian production or military service, 125 millions to our 97 millions; on ground force strength, more than 175 divisions to our more than 20 divisions. True, we have a larger Navy, a more modern Air Force, and, above all, a greater productive potential plus a tremendous advantage in "know-how." To compensate for that advantage, the USSR has, for years, geared her industry almost entirely to the production of heavy goods from which are manufactured war matériel, rather than

Our strength lies not only in our resources, but in the ability to use them properly. Use of palletized unit loads in handling matériel is an example of applying our 'know-how' to save manpower, time, and money

balancing her output with the production of some consumer goods. With an over-all population larger than ours, with a mobilization potential vastly greater than ours, with an army, in being, of more than 175 divisions that can be increased to 300 divisions within 180 days, can we afford to divert so much of our Nation's manpower to noncombat jobs? Obviously, unless we believe that the USSR is building and equipping a huge army just to use at ceremonials, we must cut down the number of men needed to support our combat troops.

How Accomplished

Just what are some of the ways in which this drastically needed cut can be made? One obvious and simple way is to cut down on the supplies and services rendered. While it is true that the American soldier is the most adequately supplied and serviced warrior in history, there are definite limitations to the savings in manpower that can be achieved if we intend to maintain a mobile, hard-striking army. One indication of the amount of supplies furnished and services rendered in our average division (17,000) is the amount of daily maintenance tonnage required—approximately 600 tons. The smaller Soviet division (12,500) is able to skimp along on only 200 tons daily (272 tons, if their divisions also numbered 17,000). However, part of their savings is achieved through the use of animal transport which lives off the land.

Another method of decreasing the amount of supporting personnel, that must be exploited to the greatest possible degree, is more accurate and realistic planning. Now that we have modern experience tables, our planners do have, at least, a basis on which to develop their plans. However, these experience tables should be used only as a rough guide, for they include all the results of the inaccurate estimates and plans of World War II. The old theory of adding an extra 10

percent for this contingency and another 10 percent for that eventuality must stop. An outstanding example of poor planning and oversupply is found in the ammunition situation in the European Theater of Operations during World War II. *More ammunition was in storage, in depots in the theater, at the end of the War than had been used during the entire campaign.* The cost in money and man-hours of the overstocking of this one class of supply alone would run to astronomical figures. The manufacturing, transportation, and the storage costs involved all point up the possibilities of manpower savings through more efficient planning.

Another method of reducing manpower that has already been implemented partially is the formation of logistical commands. Balanced teams of technicians that have become accustomed to working together, with the resultant knowledge of each other's capabilities and limitations, will permit a better job to be done with an over-all saving in manpower.

Use of Pallets

The method that appears to have the greatest possibility in our further efforts to cut the number of supporting personnel required is the Army-wide use of mechanical rather than manual means for moving supplies. Specifically, in this article, the use of the palletized unit load is discussed. This is one manpower saver that has been exploited only slightly by the armed services. The Navy studied, experimented with, and made limited use of the palletized unit load in the last War, but their total tonnage so transported was small in comparison with the over-all tonnage shipped by the Army.

Palletization, as such, has been an item of growing importance to industry for the past 15 years. In its simplest form, palletization is merely the process by which a machine is able to move, stack, and store one large package, composed of many smaller packages, rather than having

many men carry, stack, and store smaller component packages one at a time. The prime requisites for palletized loads are the pallet and the fork-lift truck. The pallet is a movable platform so constructed

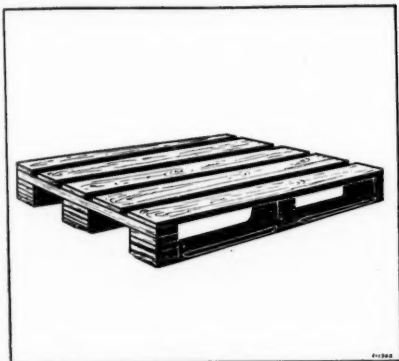


FIGURE 1.

A Type of Wooden Pallet.

that the forks of the fork-lift truck may easily enter its sides or ends preparatory to lifting and transporting it. The fork-lift truck is a commercial-type lifting, transporting, and stacking machine. Pictures of a pallet and fork-lift truck are shown in Figures 1 and 2.

Unit Loads

A unit load is formed when several individual packages are fastened to the pallet, and become, at least temporarily, a unit with the pallet. This unitization may be accomplished either by gluing the packages and the pallet together, or by strapping the packages to the pallet with metal bands. After the unit load is formed, it may be loaded into rail cars, trucks, ships, or depots as a single unit by means of mechanized equipment. Shipment of non-palletized goods entails the use of rollers, conveyors, skids, and the necessary manpower to get the packages to the rail car which has been "spotted" on the siding at the manufacturer's plant. The actual loading and stacking of packages within the

rail car must be done manually by handling each package individually. When the goods are then transported to a ship or warehouse, again the packages must be handled individually and manually. These multitudinous handlings of individual packages are a prime factor in the over-all cost of distribution in our present-day economic system and, in time of war, necessitate the expenditure of enormous quantities of manpower by the armed services.

It is visualized that the palletized unit load, as an integral part of our Army-wide distribution system, would be utilized much as follows. All supplies and equipment small enough to be capable of palletization would be palletized by the manufacturer as a final step in his production line. Then

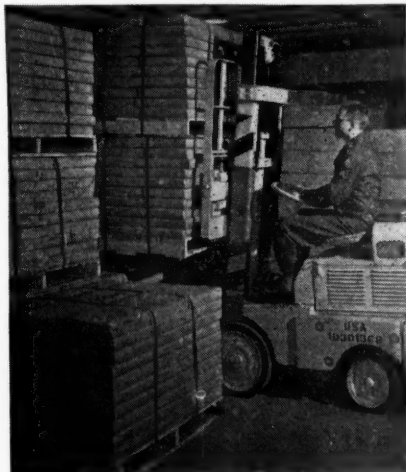


FIGURE 2.

A fork-lift truck being used at the Army Field Printing Plant, Fort Leavenworth. the goods would be moved as unit loads by fork-lift trucks into the rail cars or trucks for shipment to a depot. The unloading process at the depot again would be done with fork-lift trucks that could use their lifting and stacking abilities to utilize more efficiently the cubic capacity of the

depot. When the goods were called forward to the port, the same process would obtain in getting the unit loads out of the depot into the rail cars, out of the rail cars on to the dock, from the dock into the ships, and, by the same process, as far forward in the theater of operations as supplies are needed in quantity. With the average front-line division requiring 600 tons of maintenance supplies daily, supplies for these divisions could be retained in unit loads at least to the army supply points, and, for Class I and Class V supplies, probably through the supply points to the using divisions. All through the supply pipe line, from the manufacturer to the using units, it would be necessary to furnish additional equipment or adapt old equipment. That, however, is exactly what we want to do—substitute mechanical effort for manual effort whenever the machine can do the job better and more efficiently than can the man, so that the man will be freed for necessary combat duty. One example of the adaptation of equipment possible would be the use of A-frames mounted on 2½-ton trucks to compensate for the unavailability of the proper type fork-lift truck.

In amphibious landings, it has been found practical to palletize at least 50 percent of the assault supplies on toboggans or sled-type pallets. If all supplies were palletized by the manufacturer, it would save time and manpower to secure the unit load directly on to the assault toboggan in the forward areas.

Types of Pallets

About the pallets themselves—the present-day commercial pallet weighs from 75 to 100 pounds, is made of wood, and costs about \$3.00. Aluminum pallets weigh only 36 pounds, cost more, but last longer. However, in a national emergency, aluminum as a critical commodity probably would not be available for this use. A recent innovation is the expendable pallet. It weighs only 6 pounds, and costs

less than a dollar. This pallet capitalizes on the inherent strength of a cylinder and consists of a flat sheet of corrugated paperboard supported by nine spiral-wound paperboard tubes. The whole assembly then is treated chemically to make it moisture-proof.

Whatever the type or types of pallets used, they will be of value in the theater after they have been "divorced" from their loads, as dunnage, for construction purposes, as fuel, or they may be utilized for the return of salvage to the Zone of Interior where they could be used in another transportation cycle.

Other Savings

The savings that can be realized in the Army-wide use of the palletized unit load applies not only to manpower alone, but also permits of substantial savings in money and in the turn-around time of the various modes of transportation used. In addition, the use of pallets results in less damage to the goods transported and, because of the larger size and weight of the unit load, minimizes pilferage.

When discussing money savings, the best authority to which to turn, understandably, is industry. Business organizations must show a profit or they will soon vanish from the American scene. As a result of numerous surveys and studies made by business concerns, it is estimated reliably that a financial saving of 66 percent of the cost of loading and unloading merchandise is averaged—even including the cost of equipment—when modern materials handling methods are used. Additional indirect savings are realized in lowered transportation charges due to the more speedy release of transportation equipment (freight cars, trucks, and the like). These indirect savings have been reported, by some organizations, to be as high as 20 percent of the transportation charges.

A more difficult to estimate, but definite, saving results from decreased checking and inventorying expenses. With the unit load

system, it is only necessary to count the number of pallets and multiply by the number of packages on each pallet to obtain an accurate inventory and check, rather than being forced to check and inventory each individual package. Experience has shown that by the use of unit loads, damage to goods in shipment is reduced to a negligible amount. In 1946, the American railroads had damage claims amounting to \$95,000,000 filed against them. However, this does not represent the entire cost to industry resulting from material damaged in rail shipments, for most industrial concerns do not file individual claims of less than 10 dollars. The total damage loss, therefore, would run to a much larger figure. Industrial experts claim that a large percentage of this loss can be obviated through the use of unit loads.

Economize on Transportation

In time of war, commanders and staff officers at all echelons have found an almost universal shortage of transportation. The use of the palletized unit load will permit the more efficient use of transportation and, in effect, increase the quantity of transportation available.

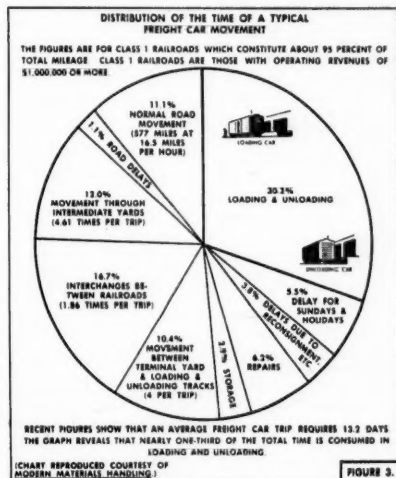
An example of how use of the palletized unit load can increase the amount of transportation available to the commander is found in our own domestic railway system. Recent figures (Figure 3) show that an average freight car trip requires 13.2 days, that is, from its point of origin to destination. Of this total round-trip time, 30.3 percent is spent in loading and unloading the car. It is in this phase of freight car usage that a great saving in turn-around time can be made. By use of the palletized unit load and its partner, the fork-lift truck, a saving of 75 to 80 percent in loading and unloading time is being realized in rail shipments. In the example cited, where 30.3 percent of the total trip of 13.2 days is consumed in loading or unloading operations, it means

that the freight car has been unavailable for use as a transporter for more than 4 out of every 13 days.

Mr. Norman L. Cahners, editor and publisher of *Modern Materials Handling*, states, in an editorial beamed at the Association of American Railways, in the October 1947 issue of his magazine:

Railroads of America: Do you want to increase your number of freight cars by at least 114,000, almost overnight? Do you honestly want to reduce the average turn-around time of your freight cars? Is it your sincere wish to speed up the movement of material from shipper to consumer? . . . Cut down your freight car waiting time by adopting mechanized handling methods. We believe you will slash your turn-around time by as much as 2 or 3 days, but remember that a cut of even 1 day would release an additional 114,000 cars for use.

We preach, in the Army, that transportation means must be used efficiently and



that the employment of rail cars, trucks, barges, or ships as warehouses is an inefficient use of those means. Yet, in effect, that is what we are doing, by not loading and unloading our means of transportation as rapidly and efficiently as is now possible with our modern materials handling methods.

Savings in Ocean Shipping

In the field of water transportation,

the same essential facts obtain. Terminal time and terminal costs are even greater in ocean shipping than in shipment by rail. Mr. Harry E. Stocker, author of *Materials Handling*, maintains that:

Stevedoring costs—that is, marine-terminal materials handling costs—are the largest single item in the operation of a vessel, approximating over one-third of operating expenses. In some lines, stevedoring charges have amounted to 50 percent of gross revenue.

Despite the great cost of handling goods at marine terminals, and the financial and manpower savings that can be made through the use of the palletized unit load, some operators still object to the principle of stowing ships using unit loads. Their objections hinge principally on the possibility of losing stowage space caused by the larger unit loads failing to conform to the curvature of the ships' sides, and the physical obstructions in some of the holds themselves.

There are two answers to these objections. One is found in a direct quotation from Mr. Stocker on this subject in which he says:

Objections of this character are based upon a lack of knowledge of the facts, or a lack of understanding of the fundamental principles of transportation. It needs to be emphasized that the most profitable results are measured not just by the number of tons transported per voyage, but also by the number of tons a ship transports in a year. If, by stowing part of the cargo on pallets, the port time is reduced and the ship makes an additional fraction of a voyage a year, that offsets the lower revenue on each voyage due to space lost in pallet stowage. In addition, there is the advantage gained in a reduction of 30 to 40 percent in stevedoring costs. But the most important consideration is that cargo can be loaded or unloaded in much less time, with either a saving in overtime or in the terminal time of the ship or both, because it is handled in large units.

Navy Experience

Our second answer to the objection cited above is found in Navsanda Publication Number 13, published by the United States Navy, in which their experience shows: "When tightly stowed, the total lost stowage, including space occupied by the double-face pallets can be kept to between 13 percent and 15 percent. Lost stowage on a hand-stowed ship also runs

up to 15 percent, because the individual items are not packed together as tightly as the strapped unit load binds them." Figure 4 indicates clearly the result of a carefully controlled experiment undertaken by the United States Navy.

Industry Proves Savings

The saving of money is, of course, of vital concern to all military personnel, but the savings in time, manpower, matériel, and in vitally needed transportation are even more important. An outstanding example in which all of these savings were achieved is reported in the November 1948 issue of *Modern Materials Handling*. The Bristol-Meyers Company of New York, in conjunction with the Isthmian Steamship Company, made a test shipment of 24 pallet loads, consisting of 1,100 cartons, to the west coast. As the loads remained palletized throughout the entire journey, from the east to the west coast, economies occurred all along the line. At the shipping point, it was estimated that one-fifth of the time was required to handle the palletized goods as against the unpalletized goods, as one man and one fork-lift truck did the job. About 20 percent was saved in the cost of transporting the palletized merchandise, for the trucking firm was able to effect a speedier release of the equipment. Also, the payment of the trucking rate for detention time, a frequent charge sustained when individual cartons have to be loaded, stored in the truck, unloaded, and checked, was eliminated. Finally, checking time and inventory record-keeping time also was reduced considerably by the use of the unit load system.

The Bristol-Meyers organization made additional savings due to the maximum utilization of their warehouse space through palletized storage. Further, worker safety was increased and fatigue lessened. Other important costs—damage to merchandise and pilferage, common

factors when cartons are handled and re-handled manually—were virtually eliminated.

The Isthmian Steamship Company reported a saving of 80 percent in the number of man-hours needed for truck unloading, storing, and the transfer of merchandise to shipside for loading. Another saving of 50 percent in man-hours was

World War II Tonnage

During the 45 months of the War, more than 126,000,000 measurement tons, or approximately 63,000,000 long tons, of Army cargo were shipped overseas. Of this amount, it has been estimated that at least 33 percent (21,000,000 long tons) could have consisted of palletized unit loads. Civilian producers estimate that

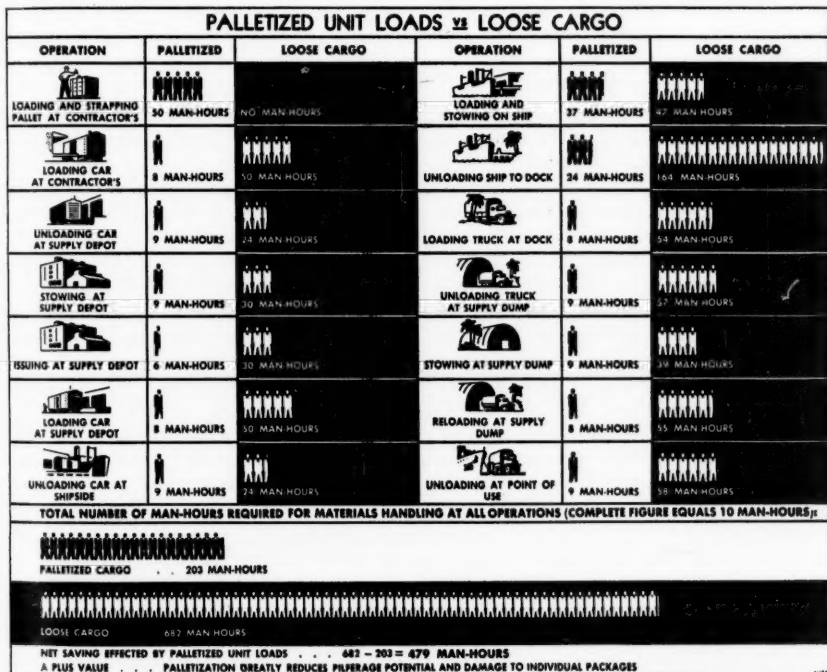


FIGURE 4.

This graphic chart gives a complete picture of the value of palletizing vs. loose cargo handling. The number of man-hours required to handle 100 tons of palletized cargo (approximately 77 pallet loads) is compared with the number of hours required to handle the same amount of loose cargo (4,080 separate packages).

(Chart reproduced courtesy of US Navy.)

achieved in the shiploading operations. The unloading, storing, and transfer of the shipment on the west coast produced the same savings that had been made in New York.

the average package of merchandise that is shipped overseas, in peacetime, will be handled a minimum of eight times before it reaches its destination. The United States Navy experience, depicted on Fig-

ure 4, shows 14 such handlings. It is only reasonable to assume that Army cargo, in time of war, will be handled at least as many times as the peacetime figure of the civilian producer (and perhaps even more) before it, too, reaches its final destination. Striking a conservative average of 10 handlings, for ease of calculation, we may conclude that about 21,000,000 long tons were handled a minimum of 10 times giving a total of 210,000,000 long tons handled—all of which could have been moved by mechanical means.

In the Zone of Interior, of course, an even greater tonnage of Army supplies was moved. In the same 45-month period, more than 300,000,000 short tons were moved on War Department Shipping Documents, averaging 700 to 780 miles per move. Assuming that all the Army supplies destined for overseas forces were transported at least once in the Zone of Interior, and not considering the tonnages of petroleum, oil, and lubricants that were moved to ports of embarkation by pipe line, the remaining 230,000,000 short tons of Army supplies were utilized in the Zone of Interior. Applying the same palletization factor of .33, about 80,000,000 short tons could have been moved as palletized unit loads. If it is assumed, further, that a minimum of four handlings took place in the Zone of Interior (manufacturer to rail car, rail car to depot, depot back to rail car, and then, finally, by rail car to the post, camp, or station), 320,000,000 short tons of Army cargo could have been moved by mechanical means.

Manpower Savings

What does all this tonnage mean in man-hours—that item in which we are so profoundly interested? Three tons handled manually each hour is considered by the United States Navy to be a high average for a laborer loading and unloading supplies. On this basis, of the more than 70,000,000 man-hours spent in loading and

unloading supplies for our overseas theaters, approximately 49,000,000 man-hours (based on the data in Figure 4) could have been saved by the use of the palletized unit load. Further, in the Zone of Interior, 73,500,000 of the more than 105,000,000 man-hours required to load and unload Army supplies could have been saved by using palletized unit loads.

Can this enormous saving in man-hours actually be accomplished? Is it really worth considering? Industry is using mechanized handling of raw materials, parts, and finished products to a greater extent each year. Those companies that have shifted to the use of the palletized unit load are making great savings because of lowered cost of transporting merchandise, and because it has less chance of damage in transit. Even the Federal Government is interested. The Division of Simplified Practices, Bureau of Standards, Department of Commerce, has helped industry standardize on pallet sizes. It then assisted in the development of containers, and packages to fit those containers so that the best use of the standard size pallets would be made. All of these efforts at pallet standardization have been beamed at establishing one or two sizes, more or less acceptable universally, that will best utilize the capacity of our national pool of rail cars and our commercial and Army trucks.

The Navy has gone even further in this effort. They have recommended that new ships be so constructed as to permit better utilization of their storage space, rather than continuing the old practice of building a ship around its engine and then utilizing the "left over" space for cargo carrying.

Conclusions

Admittedly, the Army-wide use of the palletized unit load will not be a universal panacea for the "combat manpower" problem.

However, use of the palletized unit

load will permit enormous savings in non-productive man-hours now spent in loading and unloading supplies.

Important money savings will be realized, for distribution costs within the Army will be reduced materially.

Less damage will result to our supplies while in transit.

More efficient use of our national pool of transportation will be made possible by the adoption of the unit load. Critical materials needed to build additional transportation will be saved, for less transportation will be needed.

Smaller quantities of supplies will be

required in the pipe line because of the more rapid delivery of the supplies to the ultimate consumer.

Finally, losses due to pilferage will be greatly reduced, for it would take an abnormally strong "pilferer" to walk off with a 2,000-pound unit load.

These profits from palletization *can* be achieved. They *must* be achieved if we intend to maintain our American way of life. We must become more mechanized and more efficient if we hope to meet successfully the Communist-inspired hordes confronting our own limited national manpower today.

Discipline in the Army today cannot be founded on the ancient shibboleth of "Theirs not to reason why, theirs but to do and die." American soldiers particularly must know the reason why and must be convinced of the importance of their individual tasks in the operation of a unit. Hence the importance of the individual is paramount, and respect for the rights of the individual is the keynote of American discipline and American leadership.

General J. Lawton Collins

The Aitape Operation

Lieutenant Colonel Millard G. Gray, *Infantry*
Instructor, Command and General Staff College

IN THE spring of 1944, Lieutenant General Adachi commanded the Japanese Eighteenth Army. Among other things, he was charged with the defense of New Guinea, most of which the Japanese had occupied in 1942. By March 1944, United States and Australian forces had pushed the Japanese back from most of their easily won New Guinea empire. This left General Adachi two critical areas to defend, with the Allied forces pushing up the coast from Madang. These were the Wewak—Hansa Bay area and the Hollandia—Aitape area. In these locations, General Adachi had some 50,000 combat troops, plus an undetermined number of service personnel. The United States and Australian forces had what amounted to complete naval and air superiority in the area. Based on previous operations of the Allied forces in the Southwest Pacific, General Adachi estimated that the next move would be to seize the Wewak—Hansa Bay area. Accordingly, he concentrated the greater part of his combat force there. Hollandia and Aitape were left undefended, except for that defense which could be organized with 5,000 odd service and base troops.

On 22 April 1944, under the direction of the United States Sixth Army, the United States I Corps landed, with little opposition, at Hollandia with a force consisting of two infantry divisions less one regimental combat team (RCT). On the same day, Task Force *Persecution* landed, almost unopposed, at Aitape, some 120 miles east

of Hollandia and about 90 miles west of Wewak. This task force operated directly under the Sixth Army. It was composed of a task force headquarters, the 163d RCT of the United States 41st Infantry Division, the 127th RCT of the United States 32d Infantry Division, and a rather large proportion of service support troops, principally engineers, to restore and augment the facilities of the Tadjai airfield.

The primary objective of the task force was to secure the Tadjai airfield, located near Aitape, and establish operational facilities there for fighter aircraft. This was done in order to cover the Hollandia area with land-based aircraft, in as much as Hollandia was beyond the range of fighter plane bases in Allied hands.

By these operations, the Allies had seized Hollandia and established a road block at Aitape to prevent General Adachi from moving his main force from Wewak to attack the base being developed at Hollandia.

Aitape proved more than a road block to the Japanese force, or a field on which to base fighter plane cover for Hollandia. The fine airstrips at Hollandia were secured quickly, but the terrain was such that it was some weeks before supplies in any quantity could be moved from the beaches to the airfields at Lake Sentani. The airstrip at Aitape was in operation by 3 May, and, for some weeks thereafter, in addition to serving as a fighter base, was used as a base from which supplies were flown to the Sentani airfields at Hollandia.

The Aitape area is a low coastal plain backed by the 4,500-foot peaks of the broken Torricelli range of mountains, from 5 to 12 miles inland. There is no acceptable harbor, but the Aitape road-head is somewhat shielded by three small islands. There are about 13 miles of fair, although exposed, beaches. Except for a number of rivers which transect the coastal plain, the region has no natural defensive barriers. Except for small patches of Kunai grass, the area is covered with heavy vegetation, tending from swampy growth on the coast to tropical forests in the mountains. Rainfall is heavy.

The area is traversed by numerous, unmapped, native trails. Movement within the coastal plain is restricted to foot travel along these trails, or along stream beds, if these happen to be dry. There are no roads. The beach line can be used for limited vehicular traffic. Inland, in the mountains, only foot movements are possible, due to the rugged terrain and dense vegetation.

Early in May, the bulk of the 32d Infantry Division moved from Saidor, in eastern New Guinea, to Aitape, joining the 127th RCT already there.

The Commanding General, 32d Infantry Division, assumed command of Task Force *Persecution*. The 163d RCT was released and rejoined its parent unit, the 41st Infantry Division.

base. (This was an *implied* mission, never confirmed in writing.)

Other tasks, subsequently assigned to the force, included the airshipment of certain supplies to the Hollandia area, and the loading of certain service troops, principally air force personnel, for movement by water from Aitape to support the Wakde and Biak operations.

Estimate of the Situation— Japanese

General Adachi recognized the growing importance of Hollandia to the Japanese position in the Southwest Pacific area. In January 1944, he stated:

Hollandia is the final base and last strategic point of this army's New Guinea operations. Therefore, it is expected that if we are unable to occupy Port Moresby, the army will withdraw to Hollandia and defend that area to the last man.

But General Adachi had estimated incorrectly Allied intentions and capabilities. Consequently, he found himself, in April 1944, with the bulk of his combat forces in the vicinity of Wewak, the Allies in possession of Hollandia (some 200 miles away), and no way of getting to Hollandia except by marching. He had a few trucks in poor condition, but there were no roads leading to his objective on which the trucks might operate. He had a number of barges, but these could be used only at night, due to Allied air and naval superi-

The defense, properly executed, must plan for aggressive offensive action by forces on the OPLR. Such forces must be mobile and comprise elements of all arms suitable for employment in the specific situation

The mission of the task force was modified by Sixth Army, as follows:

1. To defend the Aitape area and the installations therein.
2. To develop the Tadjai airfield.
3. To prevent the Japanese Eighteenth Army from moving from Wewak to Hollandia, an action which would interfere with the development of Hollandia as a

ority. To make matters worse, Task Force *Persecution*, at Aitape, was astride the principal and only feasible route to Hollandia. The fault was not entirely General Adachi's; General Adami, General Adachi's superior, had planned to reinforce Hollandia with one infantry division from the Philippine Islands. This never did arrive.

General Adachi had two infantry divisions—the 41st and the 20th. These were almost at full strength, about 10,000 men each. He also had a conglomeration of service troops (air force and army), as well as remnants of some marine and army units that had been pushed back to Wewak as the Allies advanced up the coast of New Guinea. He had no air and naval support nor any logistical support other than that in his area.

His courses of action were:

1. He could sit at Wewak and watch his forces starve to death, or die of malaria and other diseases. This was not the way of the "Samurai," nor did it accomplish his mission of defending New Guinea.

2. He could attack Hollandia by bypassing, through the rugged Torricelli Mountains, the Allied beachhead at Aitape. This would, if successful, partially accomplish his mission. However, the logistical problems of moving his forces through the Torricelli range were almost insurmountable, and few effectives would arrive, ready for combat, at Hollandia. Further, the Wewak—Hansa Bay area would be so weakened that Australian forces, moving up from Madang, would find the occupation of the area relatively easy. The Japanese forces moving on Hollandia would have the United States forces at Aitape on their flank and rear.

3. He could attack the United States forces at Aitape, contain them within that area with a part of his force, bypass on the limited area of the coastal plain, and attack Hollandia. If successful, this would partly accomplish his mission. The attack to contain the forces in the Aitape area would be costly. In all probability, an insufficient force then would be available for the attack on Hollandia.

4. He could attack and destroy the forces at Aitape, advance on Hollandia, and attack and destroy the forces there.

This, if successful, would accomplish his mission completely. This course of action used the most favorable terrain for movement. The efforts of the force would be concentrated on both objectives successively, and it would be always near the seacoast so that the Japanese Army, Navy, or Air Force could assist in the operations. [Actually, and General Adachi must have known it, there was little possibility, at this time, of Japanese reinforcement or assistance.]

General Adachi apparently made his decision in early May. He decided to attack the United States forces at Aitape with the two divisions at his disposal. He would destroy the forces at Aitape and then move on and attack Hollandia.

Estimate of the Situation— United States

To accomplish his mission, the Commanding General, 32d Infantry Division, had available his division at almost full strength. The division previously had seen extensive combat and contained many battle-experienced officers and enlisted men. It had arrived in Australia in early 1942, and had fought in the Papuan campaign for some 4 months (Buna, Gona, and Sanananda). After a period of intensive training and rebuilding, in Australia, it returned to the New Guinea area in September 1943. The major part of the division had participated in the Saidor operation in early 1944. The division was experienced in fighting the Japanese and the jungle.

Other combat forces available at Aitape were the 632d Tank Destroyer Battalion, a unit that had been with the 32d Division ever since it first arrived in Australia; the 383d Antiaircraft Artillery Automatic Weapons Battalion; two batteries of the 743d Coast Artillery Battalion (AAA gun); the 872d and 875th Engineer Aviation Battalions, Airborne; and one boat company of the 593d Boat

Regiment, 2d Engineer Special Brigade. In addition, there was a comparatively large group of medical, ordnance, quartermaster, and signal service troops.

There were three general courses of action by which the mission could be accomplished:

1. Retain the bulk of the forces at Aitape, establish a strong defensive position there, and outpost the defensive perimeter with a strong reconnaissance force to delay the enemy and provide timely warnings. This plan provided for the strong defense of the Aitape beachhead area and accomplished the basic mission. It ensured the availability of the bulk of the forces for the defense of the Tadjai airfield and the other installations in the area. It permitted the enemy, however, to concentrate his forces, at locations of his choosing, for an attack on the beachhead area. If the enemy so chose, he could contain the United States forces in the Aitape area, bypass them, and then move on to Hollandia.

2. Establish a strong defensive perimeter around the Aitape area; locate a strong blocking force to the east, between the perimeter and the enemy; and organize a strong reconnaissance screen south of that blocking force extending into the mountains. This plan would accomplish the basic and implied missions. It would ensure the defense of the Aitape area, stop or retard the enemy at the blocking position, ensure timely warning of the approach of enemy forces, and prevent the enemy from assembling close to the perimeter for his initial attacks. It did mean that the forces available would be dispersed between two major defensive positions. The enemy might succeed in driving a wedge between the main perimeter and the blocking position to the east and then be in a position to defeat the force in detail.

3. Establish a strong defensive position around the Aitape area, man it with

a minimum of combat and service troops, and move the main combat force through the jungle of the coastal plain and down the coast to intercept the advance of the enemy from the Wewak area. This plan would delay the advance of the enemy, but it would leave the Aitape area lightly defended. The forces at Aitape were not large enough, in comparison with the enemy forces, both to defend the area and send a strong enough force to strike the enemy as he advanced. The nature of the terrain was such that an advance of any distance toward the enemy would impose great logistical problems. The only means of vehicular movement was down the beaches by truck, or along the coast by boat using the boat company of the 593d Boat Regiment. Further, such an advance would disperse the available forces. This plan, if adopted, would provide the enemy with an excellent opportunity to bypass or trap any such advancing force, and move on to attack the relatively undefended Aitape area.

The decision, generally, was as follows:

1. To construct a strong defensive position around the Aitape area.
2. To establish a defensive force along the Driniumor River. This could be reinforced with relative ease by forces in the Aitape perimeter.
3. To send strong reconnaissance forces inland into the Torricelli Mountains and east of the forces on the Driniumor River.

Operations: 4 May—28 June

The forces in the Aitape area were divided between two general sectors: the main line of resistance (MLR) for defense of the Tadjai airfield and the other installations between the Raihu and Nigia Rivers, and the outpost line of resistance (OPLR) along the Driniumor River. Figure 1 is a sketch depicting this organization. For purposes of control, the area within the MLR, called the Western Defense Sector, was retained

under the command of the task force commander. The command of the OPLR, known as the Eastern Defense Sector, was delegated to the assistant division commander of the 32d Infantry Division.

There were two approaches from the Tadjii airfield area to the OPLR. One was down the beach to the mouth of the Driniumor River and then inland. The second was from the mouth of the Nigia River generally south along a native trail to Chinapelli, thence to Palauru, and east, along a low ridge, to Afua. The area between the Nigia and Driniumor Rivers was generally swampy. This swampy area extended from the coast to about 5 miles inland. Then, the ground rose abruptly to the Torricelli Mountains. The OPLR was an excellent blocking position, insofar as location was concerned, against an enemy advancing from the east. An enemy blocked from crossing the river would be forced to go through the Torricelli Mountains, an operation of great difficulty for a military force.

The MLR enclosed an area about 8 miles long and 4 miles deep. In it were located all the troops and installations, less those troops on the OPLR and those constituting the reconnaissance screen. The task force commander retained responsibility and control of all reconnaissance elements south of the MLR to and into the mountains, and east to the OPLR. The Eastern Defense Sector commander was made responsible for all reconnaissance south of his position into the mountains, and east of the Driniumor River to as far as he could go.

The Western Defense Sector probably was the most thoroughly organized defense position of any developed by United States forces in the Pacific theater. On either flank was an unfordable river. To the south of the area enclosed by the MLR, as shown in Figure 1, the ground generally was swampy up to the mountains. The MLR followed the dividing

line between the comparatively high coastal area and the swampy area. Along this line, more than 1,500 mutually protective log bunkers were constructed to provide a defense in depth. The length of the MLR was about 10 miles. Roads were constructed both to the rear and laterally. Extensive communications wire was laid. Barbed wire obstacles and entanglements were emplaced along the entire front. Fire lanes were cut.

The work on the MLR was done primarily by the infantry. Available engineers were needed on roads, bridges, and the airfield.

The number of automatic weapons organic to the infantry regiments was not sufficient for emplacement everywhere desired along the lengthy perimeter. Plans were made for a redistribution of all automatic weapons of the division, and specific bunkers were assigned for their emplacement. These included the .30- and .50-caliber machine guns in the division artillery and the service units of the division. Provisions were made for crews to man these weapons.

Artillery fire plans were very detailed, and closely co-ordinated with the fire plans for the mortars of the infantry regiments. Ground fire roles were assigned to the weapons of the antiaircraft artillery units in the area. For instance, the multiple mounted .50-caliber machine guns were assigned positions on the MLR and the 90-mm guns were assigned missions of reinforcing the long-range fires of the division artillery. It was reasonably safe to use the antiaircraft artillery weapons in a ground role due to the lack of any Japanese air effort. However, the protection of the area against enemy air attack still remained the principal mission of the antiaircraft artillery units.

Commanders of all installations within the MLR were required to construct bunkers, foxholes, and wire obstacles for local protection, and to prepare and sub-

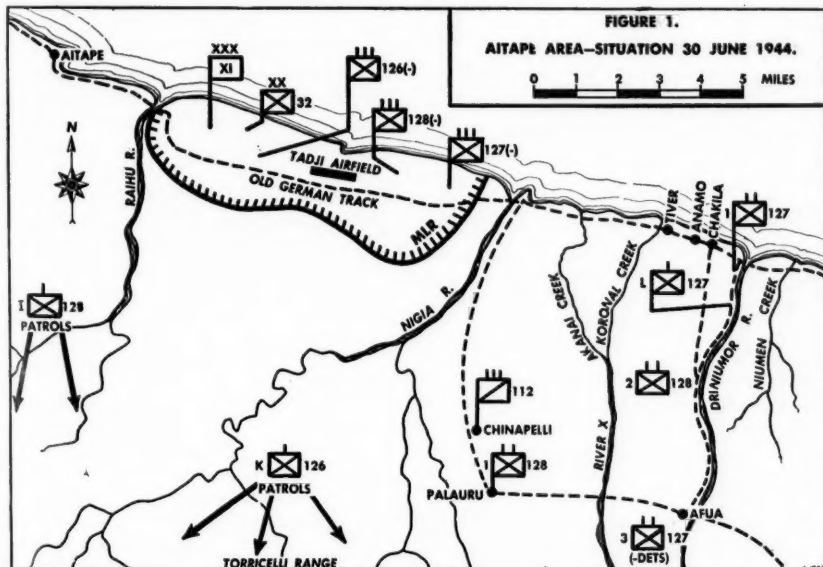
mit plans for local defense in case of a break-through. Drills were held to test these plans.

The MLR was manned principally by infantry units of the 32d Infantry Division. As the enemy increased his strength and pressure east of the Driniumor, more infantry was required in that area. Therefore, engineers and other service troops were, from time to time, assigned to and occupied sectors on the MLR. Both the engineer aviation battalions were so employed at one time during the period. It was found, incidentally, that each of these units had, organic to it, a greater number of machine guns than did an infantry battalion, despite being about equal in troop strength. This made them

Organization of the OPLR

The OPLR, as shown, extended from the mouth of the Driniumor River to the foothills of the mountains. The term OPLR is not a truly definitive one in that it does not describe accurately the purpose of the position. The position on the Driniumor River was intended to be a battle position, from which the Japanese would be prevented from advancing farther toward the Tadjia area enclosed by the MLR. If strongly held, it would force the Japanese into the mountains, or, in the event the enemy was able to force the position, the action would so weaken him as to minimize any force he could then move against the MLR.

The OPLR was held, during this period,



very suitable for employment in a defensive role, if the undesirable aspect of such employment of skilled engineer troops or their lack of training for such a role is ignored.

by three infantry battalions selected from the three regiments of the division. All were under the operational control of the sector commander rather than their respective regimental commanders. The

regimental commanders and their regimental headquarters and staffs remained in the Tadjì area.

On 28 June, two battalions of the 128th Infantry Regiment and one of the 127th Infantry Regiment were on the OPLR, disposed as shown on Figure 2. In addition, a force was located in the Chinapelli—Palauru area. Early in the period, this was a rifle company. Later a full battalion was used. The force acted as a base for reconnaissance elements, as a stop-over location for parties carrying supplies from the mouth of the Nigia, and a reserve for the forces on the southern end of the OPLR.

Throughout the period, there was a steady increase in pressure by the Japanese advancing from the Wewak area. Initially, patrols moving east from the Driniumor encountered only Japanese stragglers and were able to advance to the Drindaria River (about 8 miles east of the Harech River) without much opposition. Patrols moving inland toward the mountains from the Tadjì area found enemy patrols in that area increasing in size and combativeness throughout the period.

On 1 June, the 1st Battalion, 126th Infantry Regiment, moved to Yakumul near the mouth of the Harech River. From there, it started to make a reconnaissance in force toward Nyaparake, some 10 miles to the east. The Japanese reacted violently, driving a strong wedge between two companies operating in the vicinity of Yakumul and the remainder of the battalion, located a mile or so inland. The two companies on the coast were evacuated by landing craft; the rest of the battalion fought its way back to the Driniumor.

Operations during the entire period can be summed up as including the preparation of defensive positions and vigorous patrolling. The areas south and east of the MLR and east of the Driniumor were

patrolled constantly by both Japanese and United States forces. There were patrol clashes every day. Quite frequently, elements carrying supplies from the mouth of the Nigia to Chinapelli and Afua were ambushed. However, no Japanese patrols are known to have penetrated the MLR. Japanese capabilities and plans, outlined in Figure 2, were quite clear by the end of the period. Captured orders, documents, and prisoners told a reasonable and clear story. Even the approximate date of the Japanese attack (about 10 July) was known. By the latter part of June, the Japanese had established a strong counter-reconnaissance screen just east of the Driniumor which our patrols could not pierce. Air reconnaissance provided little information; there was too much jungle.

Japanese Plans

The Commanding General, Sixth Army, at Hollandia, was kept fully informed. By 28 June, it was estimated that the Japanese planned to conduct the following operations:

1. The 41st Division, from concentration areas east of the Driniumor, would strike the Driniumor on a narrow front, drive through to the Nigia River, and assault the MLR on its east flank.

2. The 20th Division, from concentration areas farther inland, would envelop the right flank of the Driniumor south of Afua, drive through along the general line Afua—Palauru, and strike the center of the MLR from the south.

Each division consisted of about 10,000 troops, with an unknown number of service troops in support. Further, it was apparent from patrol reports that General Adachi had been able to move his forces into the area in reasonably good condition. Japanese killed by patrols were found to be in good physical condition, and their equipment was in excellent shape. They apparently had a sufficient supply of food and ammunition.

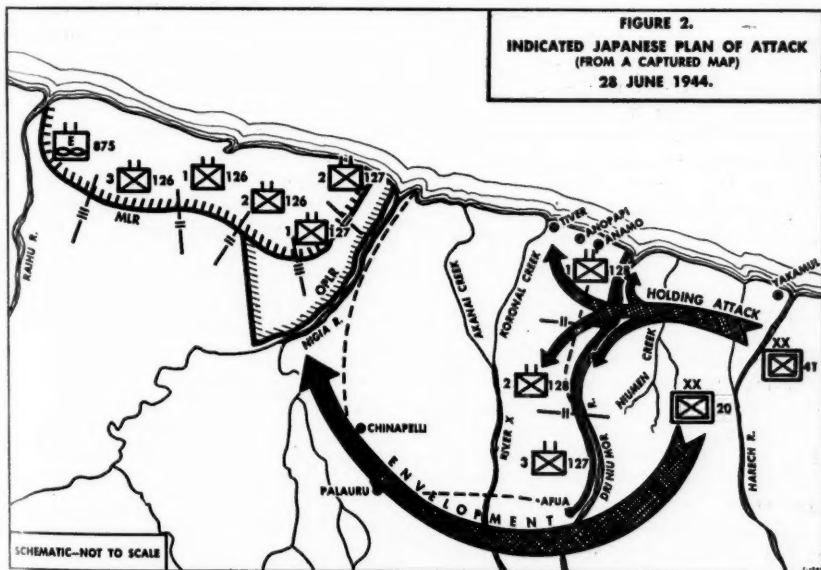
Due credit must be given to General Adachi. Despite constant, unopposed air activity against his forces and a lack of transportation, he had moved two infantry divisions and their supplies 80 to 100 miles over jungle terrain in about 30 days, almost entirely on foot. He was able to bring up a goodly number of mortars and machine guns and even some light artillery. Further, he did most of his moving at night. True, he used some trucks in the rear areas around Wewak, and was able to send some supplies by barge, but these movements also were made by night. Subject to constant air attacks, and on the coast and at sea to naval attacks, he reached the Aitape area where he staged an attack that was difficult to repel.

Research and an analysis of various

tained within the MLR while the main Japanese force bypassed and attacked Hollandia. He apparently wanted the task force to attack to the east and drive the advancing Japanese back or destroy them.

2. The Commanding General, Task Force *Persecution*, apparently felt that his force was not strong enough to do this, and that if he attacked to the east the Japanese would envelop his force, take the Aitape area, and leave him without a base. Further, he apparently believed that his solution was the best. He planned to delay, disrupt, and destroy the advancing Japanese force by a flexible defense and, if forced to do so, withdraw to the strong fixed defenses of the MLR and let the remnants of the advancing Japanese force beat themselves

FIGURE 2.
INDICATED JAPANESE PLAN OF ATTACK
(FROM A CAPTURED MAP)
28 JUNE 1944.



reports indicate the following:

1. The Commanding General, Sixth Army, at Hollandia, was disturbed by the Aitape situation. He felt that Task Force *Persecution* was going to be con-

to death against it. He felt that the Japanese could not get by his position without going into the Torricelli Mountains. If they did that, very few would get to Hollandia, they would be in little shape

to fight, and would arrive at a very late date. Further, the logistical support of such an attack would be most difficult.

Experienced jungle soldiers in the division agreed with the task force commander. They did not agree with the constant shuffling of troops between the MLR and the OPLR, nor the rather peculiar command set-up that resulted. They had had experience chasing the elusive Japanese through the jungle. This time, for a change, they were going to sit and let the enemy come to them. The Japanese force would have little or no artillery, and so the use of that arm gave them no concern. They knew that the United States forces did have artillery and knew what it would do to the Japanese when they got within range. The troops, therefore, were quite content to sit, dig in a bit, and shoot at the enemy, who, for a change, were the ones who had to leave the protection of the jungle and come out in the open. In the jungle, all things being equal, the advantage is decidedly with the defense. The man who sits quietly will shoot the man who has to move.

Task Force *Persecution* was numerically inferior to the Japanese. However, it did have certain advantages. It had the 32d Division Artillery, plus a tank destroyer battalion. It had, in support, two Royal Australian Air Force fighter squadrons, one United States air reconnaissance squadron, an air freight squadron, and the necessary service elements for these air units which were based at Tadjir airfield. It had the boats of one company of a boat regiment to assist in transporting men and matériel and a motor torpedo boat (PT) squadron, located near Aitape, to make life miserable for the Japanese moving along the coast.

In short, the task force commander believed that he would best accomplish his mission, *with the forces available*

to him, by using the plan adopted. The army commander who still held him to the mission of defending the Aitape area believed he should attack to the east. There was not a meeting of the minds.

Reinforcements Arrive

The army commander decided to reinforce the Aitape area and, on 28 June, elements of the XI Corps headquarters arrived at Aitape. The corps commander then assumed command of Task Force *Persecution*. On the same day, the 112th Cavalry RCT arrived in the area. On 25 June, an advance party of the 43d Infantry Division arrived, followed by the 124th Infantry Regiment, 31st Infantry Division, on 1 July. The main body of the 43d Division arrived between 15-17 July.

The 112th Cavalry RCT and the 43d Division had had combat experience in the jungle. The XI Corps headquarters had recently arrived from the Zone of Interior. It had been at Finschhafen since 22 April, and while there had spent the subsequent time in training and becoming familiar with the situation. The 124th Infantry Regiment had had no combat experience.

The letter order from the Sixth Army to the corps commander directed him to assume command of the forces at Aitape, outlined the situation, and prescribed his mission as follows:

Recent information indicates that the Japanese are planning an all-out attack against our forces in the Aitape area. It is estimated that the enemy can concentrate in the area south and east of Yakumul, by 30 June, a combat force of 20,000. Additional units of a strength of approximately 11,000 are reported to be in the Wewak area. Small enemy reconnaissance elements are operating south of the Torricelli Mountains.

Missions assigned Task Force *Persecution* remain unchanged (defense of the Tadjir airfield and other installations at Aitape). In carrying out these missions, you will conduct an active defense, breaking the initial impetus of the Japanese attack against a flexible defense system and following up with a vigorous counteroffensive when the strength of your force and the tactical situation permits.

Actually, the mission and operations instructions contained in the letter order

were only a repetition of those given the previous commander. The difference was the number of troops available to accomplish the mission. In 3 weeks—28 June to 17 July—the combat forces at Aitape were more than doubled.

Operations: 28 June—10 July

Based on estimates of enemy capabilities, the augmentation of the task force, and the interpretation of his directive, the corps commander decided to reinforce the Eastern Defense Sector. On 29 June, the 112th Cavalry was moved to the vicinity of Palauru to strengthen the right of the line. The mission given to the Eastern Defense Sector commander was:

"You will take vigorous action to provide maximum resistance to any westward movement between the Driniumor and Nigia Rivers without sacrificing your command."

Vigorous patrolling east of the Driniumor, during early July, showed an increase in Japanese activity. All signs pointed to an imminent attack on the OPLR, probably in the area some 3,000 yards in from the mouth of the river. There was a second possibility that this might be a holding attack to cover an envelopment of the right flank of the OPLR. This latter possibility was indicated by a captured operations map. The corps commander decided to develop the situation and bring matters to a head.

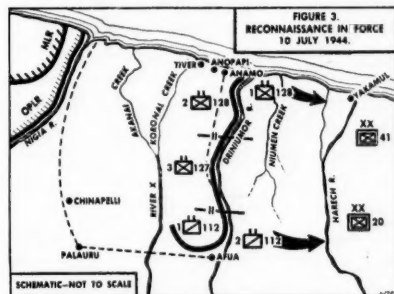
Accordingly, he issued orders, on 9 July, to the Eastern Defense Sector commander to execute a reconnaissance in force. One battalion of infantry (1st Battalion, 128th Infantry) was to advance east from the vicinity of the mouth of the Driniumor along the track that ran close to the beaches. It was ordered to destroy or drive back any enemy encountered. One squadron of cavalry (2d Squadron, 112th Cavalry) was to advance east from the vicinity of Afua. It was ordered to avoid contact with the enemy.

This action is depicted in Figure 3. The two forces were ordered to maintain contact with each other in this advance!

No additional forces were made available to execute this reconnaissance. It was necessary to take a cavalry squadron and an infantry battalion from the Driniumor line. The remaining elements were extended to cover the vacated positions, as shown in Figure 3, with the following frontages:

1. 2d Battalion, 128th Infantry—3,300 yards.
2. 3d Battalion, 127th Infantry—2,800 yards.
3. 1st Squadron, 112th Cavalry—3,000 yards, with its right flank "in the air."
4. The 112th Cavalry RCT, less the elements named, was located in the vicinity of the River X, near the Afua—Palauru track.

The 1st Battalion, 128th Infantry,

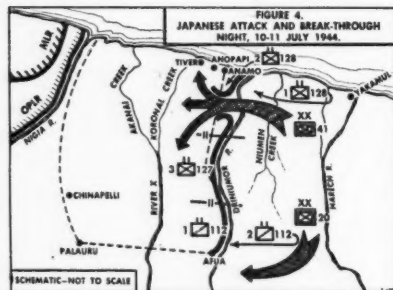


moved, at 100730 July, over relatively easy terrain, against increasing resistance. It reached a point just west of Yakumul by late afternoon. There, it ran into strong opposition from the Japanese and established a perimeter defense for the night, to permit time to reorganize and resume the attack the next morning. The 2d Squadron, 112th Cavalry, started its attack to the east at 101100 July. It met no enemy resistance but, because of exceedingly difficult terrain, was able to advance only 2 miles east of Afua by

1800. There it established a perimeter defense for the night. The two forces had had no contact with each other. They were separated by more than 6,000 yards of jungle swamp.

Climax: The Night of 10-11 July

At midnight, on 10 July, the Japanese struck. Figure 4 depicts the action. In screaming masses, they hit the thinly held front of the 2d Battalion, 128th Infantry, about 2,000 yards inland from the mouth of the river. Despite intensive prear-



ranged artillery and mortar fires and full use of all automatic weapons available, the defending forces were overrun. The next day, the Driniumor was dammed in places by dead Japanese. A terrific toll, estimated at more than 3,000, was paid by the attacking force. Casualties to the United States forces were very light. However, the Japanese had succeeded in creating a gap in the Driniumor line of about 1,200 yards. Communications in the area were disabled. A second attack, at 110500 July, widened the gap to more than 2,000 yards. Available information indicated that a Japanese force of at least a regiment was west of the Driniumor and moving north toward the Tiver—Anamo area.

Shortly after midnight, the two units that had launched the reconnaissance in force, on 10 July, were ordered to return

to the Driniumor. They reached the river early the next day.

Operations: 11-31 July

No attack had as yet been made on the south flank. Early on 11 July, a patrol of platoon size of the 112th Cavalry, operating some 3 miles southeast of Afua, met a strong Japanese column advancing on that village. The patrol engaged the column, forced it to deploy, and harassed it, slowing its advance by several hours. In the afternoon, when the enemy attempted to cross the Driniumor, a mile south of Afua, artillery caused severe casualties and temporarily halted their advance.

This was the situation in the afternoon of 11 July. The 112th Cavalry RCT, with the 3d Battalion, 127th Infantry, attached, was ordered to withdraw to the vicinity of River X, about 4,000 yards west of the Driniumor. This element was given the name "Baldy Force," and was commanded by the cavalry RCT commander. The 1st and 2d Battalions, 128th Infantry, established a position at Tiver. When the 1st Battalion, 128th Infantry, reached Anamo at daybreak, Company "C," followed by Company "A," was ordered to attack to the south to close the penetration. By 1200, this attack was forced back to the coast by superior Japanese pressure. In forcing their penetration, the Japanese had isolated "G" Company and a part of "H" Company of the 128th Infantry. This force managed to fight its way, first, to the "Baldy Force," and then to the coast, by 14 July, taking few casualties by skillfully bypassing the main Japanese force. The situation, by the end of 11 July, was as depicted in Figure 5.

Counterattack: 12-14 July

The corps commander estimated that the first mission of the task force had been accomplished. The initial impetus

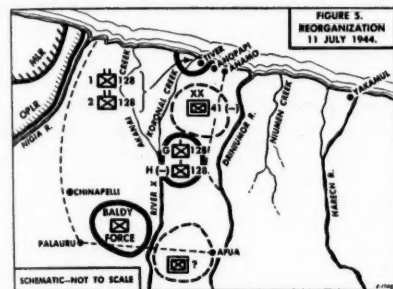
of the Japanese attack had been broken against a flexible defense system. It was now the time to launch a counterattack.

The Commanding General, 32d Infantry Division, was placed in command of the

initially, was driving south along the Driniumor. The 1st Battalion, 128th Infantry, against strong resistance, had reached the mouth of the Driniumor.

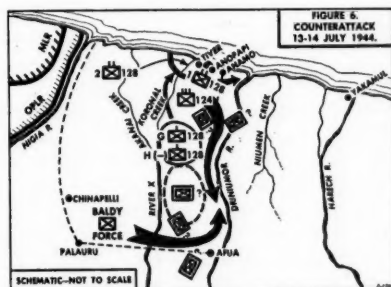
By 15 July, the Driniumor line was re-established, extending from the mouth of the Driniumor to about 1,000 yards south of Afua. The forces on line, from the mouth of the Driniumor, were 2 battalions of the 128th Infantry; the 124th Infantry, less one battalion; and the 112th Cavalry. In rear of the cavalry, at the River X, was the 3d Battalion, of the 127th Infantry.

The Japanese forces that had achieved the break-through, on the night of 10 July, were trapped between the Nigia and Driniumor Rivers. They constituted a serious threat which had to be eliminated. To accomplish this, the 127th Infantry, minus its 3d Battalion, was attached to the *Persecution* Covering Force. (Actually, the 3d Battalion already was a part of the covering force, but since it occupied a blocking position on the River X, it did not come under control of the regimental commander until later.) The regiment, minus that one battalion, was moved to a position east of the Nigia



forces on the River X line, namely the 112th Cavalry RCT, two battalions of the 128th Infantry, and one of the 127th Infantry. The 124th Infantry, minus its 2d Battalion, was attached to the force and moved to the Tiver area. The Assistant Division Commander, 32d Infantry Division, relieved of command, assumed command of the forces on the left of the MLR. The name of the force was changed from Eastern Defense Sector to the *Persecution* Covering Force to avoid confusion. Three light field artillery battalions were in position in the Tiver area. One medium artillery battalion from positions with the MLR was prepared to fire into the area between the Akanai Creek and the Driniumor.

On 13 July, an attack was made, as shown in Figure 6, to close the gap in the lines on the Driniumor. The 124th Infantry attacked south from Anamo. The 1st Battalion, 128th Infantry, attacked east from Anamo. The "Baldy Force" attacked east from the River X. By late afternoon of 14 July, the "Baldy Force," against sporadic and moderate resistance, had reached the Driniumor line at Afua and was attacking north. The 124th Infantry, after meeting strong resistance



River. From there, on 15 July, the 2d Battalion attacked east from the Koronai Creek, on a front some 300 yards inland from its mouth. The 1st Battalion moved south of the 2d Battalion and attacked east from about 600 yards south of the

mouth of the creek. Figure 7 shows this maneuver. This was a sort of "broad sweeping" of the area. It got results. The pressure from this action caused the enemy to make frenzied efforts to escape. He repeatedly attacked the rear of the 124th Infantry on the Driniumor line. Some enemy forces succeeded in breaking that line and getting through to the east. Some managed to escape to the south. Most of them were killed in the area. By this time, much of the terrain, particularly that along the Driniumor, was an olfactory horror, due to the several thousand rotting Japanese dead in the area. By about 21 July, the sweep of the area had been completed. The 127th Infantry (the 3d Battalion had rejoined it) took a position on the south flank of the Driniumor line. The 2d Battalion, 124th Infantry, was moved from the Tadji area to a blocking position on River X.

General Adachi apparently was attempting to adhere to his original plan. Evidence was available to the effect that the 41st Division was attempting to regroup east of the Driniumor. The 20th Division was attempting to turn the south flank near Afua. The 112th Cavalry and the 127th Infantry repelled numerous attacks in force during the period 18-24 July. These attacks were in varied strength, but lacked co-ordination.

During the entire period—from early May to late July—air and naval co-operation with United States ground forces assisted greatly in the destruction of Japanese combat effectiveness by pounding their rear areas. Daily, bomber and fighter elements of both the United States Air Force and the Royal Australian Air Force attacked Japanese assembly areas east of the Driniumor, their lines of communications, and bases in the Wewak—Hansa Bay area. Navy PT boats patrolled the coast to Wewak nightly. A naval task force, consisting of two Australian frigates and two Australian and

two United States destroyers, joined the operation on 14 July. Based on requests from the ground forces, this force placed intensive bombardments on Japanese assembly, bivouac, and supply areas east of the Driniumor. Later, prisoner of war reports indicated that these fires were, on the whole, very effective.

At all times it was necessary to conduct operations premised on the primary mission of the defense of the Tadji airfield area. The full effort of all the forces available could not be committed to the operations on the Driniumor. Sufficient forces had to be retained in the Tadji area to ensure the defense of the MLR. However, on 15 July, elements of the 43d Infantry Division started to arrive. Consideration had been given to landing a part of this force at Nyapapake, in the rear of the Japanese main forces. This force would then move west, placing the main Japanese force in the center between the Driniumor line and the 43d Division. This plan was abandoned, due to the inability to provide sufficient logistical support.

By 23 July, the 43d Division was unloaded completely. Units of the division were assigned to and occupied positions on the MLR as they came ashore.

Intelligence Reports

Intelligence, as of about 23 July, indicated the following enemy situation:

1. Some elements of the 41st Division were concentrated south and west of Afua, between the Driniumor and the River X. The 20th Division was south of Afua. Both units were understrength and somewhat disorganized due to battle casualties, sickness, and lack of supplies. The Japanese, however, were still full of fight. They repeatedly attacked units on the south flank. This required the forces there to maintain a strong all-around perimeter defense, alerted at all times.

2. Some elements of the 41st Division were concentrated east of the Driniumor,

and were making sporadic attacks against the center of the Driniumor line.

3. Captured documents and prisoners of war indicated that, despite his losses and poor logistical situation, General Adachi was trying to carry out his original plan of executing a holding attack against the Driniumor line and flanking, in force, the right of that line. His objective was still the Tadjji area.

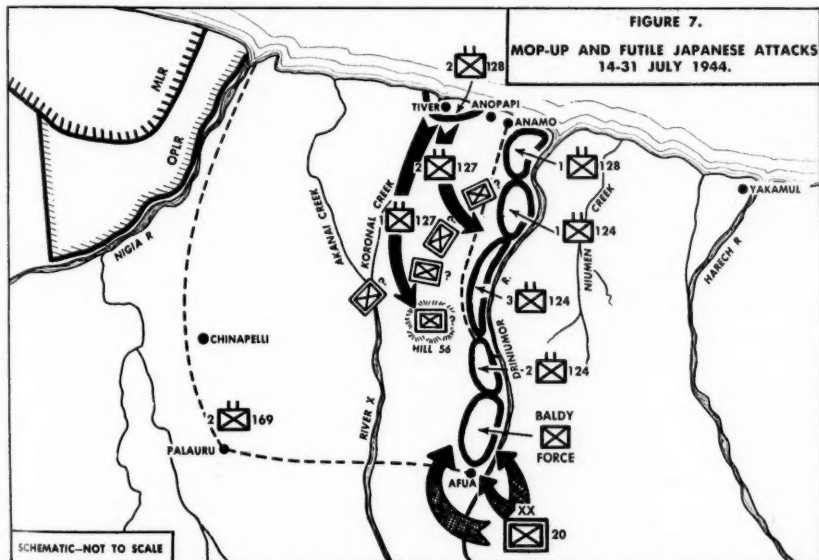
Subsequent Action

The United States counterattack, which commenced on 13 July, was deemed successful. Accordingly, the corps commander decided to eliminate the remaining forces east of the Driniumor. This would cut the Japanese lines of communications, draw off the forces harassing the south flank, and eliminate organized resistance. The

River X. That battalion then rejoined its regiment on the Driniumor. The 2d Battalion, 169th Infantry, was attached to the 124th Infantry, which, with the attached battalion, was designated as the force to mop up remaining Japanese forces east of the Driniumor and execute the plan. It was known as the "Ted Force."

Figure 8 is a sketch of the execution of the plan. The "Ted Force" jumped off from the Driniumor line at 310800 July, in the encircling movement that helped end the fighting effectiveness of the Japanese Eighteenth Army.

The 2d, 1st, and 3d Battalions of the 124th Infantry—in that order—were echeloned to the right rear from north to south, with their left flank on the coast and their right flank some 3,500 yards in-



United States forces were regrouped to accomplish this objective. The 1st Battalion, 169th Infantry, 43d Infantry Division, replaced the 2d Battalion, 124th Infantry, in the blocking position at the

land. The 2d Battalion, 169th Infantry, followed in the rear of the 3d Battalion, 124th Infantry. The first objective was the Niumen Creek. This was reached on the first day with little opposition. The

next day, the force turned south. Originally, it had been planned that it would continue to advance with three battalions in line. The condition of the terrain changed this, for movement was difficult due to the swamps and the torn-up jungle in the area. (This area had received a terrific pounding from artillery, naval guns, and air strikes for some 3 weeks.)

The movement, on the second and subsequent days, took place with two battalions forward and two in rear. To say that these battalions were in line would be inaccurate. An attempt was made to achieve this formation, but the terrain and lack of communications prevented it. Radios, the only feasible means of communication, failed to operate in the jungle. Artillery liaison planes, by radio and visual signals, assisted the force commander in controlling his battalions and dropping supplies.

The "Ted Force" then moved south, as a group of battalions, along the general line of the Niumen Creek. When east of Afua, it turned west and came into the Driniumor line north and south of Afua on 7-8 August. The advance to the south and west to Afua met with almost continuous resistance from groups of Japanese, from company to battalion in strength. All opposition was driven back or destroyed.

During the advance to the "Ted Force," the forces on the right flank had been under vigorous, frequent attack by Japanese forces in the area. When the "Ted Force" turned west, the operation to eliminate the Japanese forces south of Afua was executed. The 2d Squadron, 112th Cavalry (minus one troop), with "A" Company, 127th Infantry, attached, attacked south from Afua on the east side of the Driniumor. The 2d Battalion, 127th Infantry (minus one rifle company and the heavy weapons company), attacked southwest from north of Afua to clear the high ground 1,000 yards west

of that locality. The 3d Battalion, 128th Infantry, from the center of the Driniumor line, attacked south on the east side of the river to the vicinity of Afua. Company "B," 169th Infantry, attacked toward Afua from its blocking position on the River X in order to clear the Afua-Palauru trail. Opposition to the advances south and southwest of Afua met with strong resistance which was destroyed.

By 8 August, the "Ted Force" was united with the "Baldy Force" in the Afua area. The Driniumor line was secure. Only a few starving and sick Japanese stragglers remained west of the Driniumor, from the coast to the Torricelli Mountains. East of the Driniumor, there remained only small groups of disorganized Japanese making their painful way back to Wewak. The Japanese Eighteenth Army had been destroyed.

Maps and Logistics

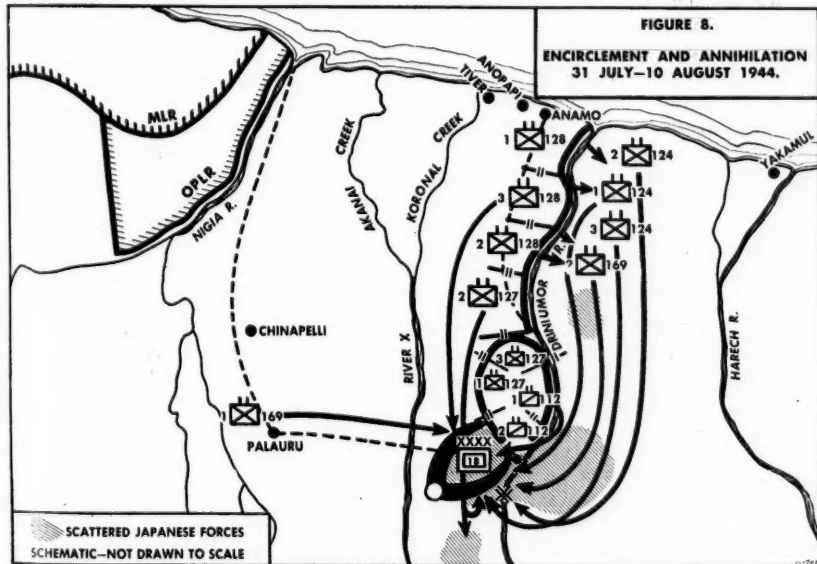
The maps available to the forces in this operation were in sufficient quantity and suitable scale. However, they were quite inaccurate, and failed to show the required detail. About the only thing that could be depended upon was the location of the coast line and the major rivers. Many villages shown did not exist; some existing villages were not shown; and some villages were located incorrectly. For instance, the location of Afua was a source of bitter bickering for some days between two regiments whose flanks were to make contact at that village. Each regimental commander insisted that *his* flank was on that village. Actually, there were *two* Afuas; an old and a new. Old Afua had become too dirty, so the natives moved upstream some 1,500 yards. Both regimental commanders were, in a sense, correct. The problem was solved by ordering them to make contact *with each other*.

The air force made a strenuous effort to supply suitable aerial photographs. These photographs were made available, but the dense jungle concealed much that the ground forces wanted to know. The River X is a case in point. The maps showed this as a river coming down out of the mountains and "petering out" in the swamp. Actually, it forked to become Koronal and Akanai Creeks. Even the excellent aerial photographs did not show this; ground patrols only could clarify the situation.

Supplies were brought forward on the backs of natives or soldiers. Roads were constructed in the Tadjai airfield area. However, from the mouth of the Nigia to the east, the only road was the beach.

There were two main supply routes. One extended from the mouth of the Nigia east along the beach to the Driniumor, and then south along that river. The other was a native track. It went south from the mouth of the Nigia to Chinapelli and Palauru, then east to Afua. All traffic on this route was by foot. All supplies that went over this track, and all casualties evacuated along it, were hand carried. Later in the operation, some tracks were opened in the area between the Nigia and the Driniumor. These were primarily "feeder" tracks, or tracks of expediency due to units being in that area.

Detailed engineer surveys of the Nigia—Palauru—Afua track were made.



This, by improvement, permitted vehicular movement east beyond the Driniumor. To the south of the coast, there were no roads. A vehicular track was cut inland from the mouth of the Driniumor and along its west bank. This extended only a few hundred yards.

Some attempt was made to make it capable of carrying vehicular traffic. As one engineer put it, however, there was not time to build a bridge that long; most of the track was in swamp.

Supply times were approximately as follows:

1. Carrying party from the mouth of the Nigia to Palauru: 8 hours.
2. Carrying party from Palauru to Afua: 8 hours.
3. Vehicle from the mouth of Nigia to the mouth of Driniumor: 2 hours.
4. Carrying party from the mouth of Driniumor to Afua: 6 hours.

The times cited above were for parties carrying supplies. Generally, it was found that natives moved as fast as soldiers. However, natives could go no farther east than Palauru, due to the possibility of enemy action. Further, the times indicated were based on meeting no enemy opposition. All carrying parties had to have strong combat protection. Ambushes of supply trains were usual during most of the operation. Carrying parties, evacuating wounded, took about twice as long to make the trip as supply parties. These, too, were ambushed frequently.

A considerable number of natives were available and used as carriers. Their use was limited to what might be termed the "rear areas." Along the Driniumor, and east of Palauru, supplies were carried by soldiers, and most of these, of course, came from the combat units.

Air supply was used extensively for the forces inland from the coast. The lack of suitable drop zones was a great problem. The principal class of supply dropped was rations, and, because of the contamination of drop zones by broken items, drop zones had to be changed frequently. For example, the 127th Infantry had a fine drop zone near Afua. A corps staff officer, new to the theater, insisted on a free drop of "C" rations, despite the emphatic warning against such a drop by veterans in the theater. The drop was made; the loss was 100 percent. The drop zone was so contaminated, smelled so bad, and flies became so thick, that a new drop zone had to be used 2 days later.

The movement of troops was difficult. It took 8 hours to move an infantry bat-

talion from the mouth of the Nigia and close it into Palauru, assuming no opposition en route. It took about the same period of time to move to Afua from the mouth of the Driniumor.

Analysis and Conclusions

During the period May-June, neither the assistant division commander (32d Infantry Division) nor the regimental commanders were utilized fully. During the period, there were never more than three infantry battalions deployed on the Driniumor line. The actions that occurred were those that an infantry regiment should be expected to handle. The commander of the Eastern Defense Sector had to establish a force headquarters. This was done by taking people from the deployed battalions and the regimental and division headquarters. Extra communications facilities and equipment had to be made available. Supply, service, and administrative problems were aggravated, since the normal regimental means usually were not available. The regimental commanders had no control over the battalions of their units assigned to the Eastern Defense Sector. For example, at one time early in June, all three battalions of the 128th Infantry were deployed on the Driniumor. A few service troops from those organic to the regiment were attached to the battalions. The balance of the regiment, including the regimental commander, was located in the Tadjia area, doing nothing in particular except guarding a small portion of the MLR. It is possible that the mission of the OPLR, on the Driniumor, was of sufficient importance to require that the direct control and command of the forces there be delegated to the assistant division commander. He might have been more valuable to the division commander in this role than in his assigned position. However, even if this were necessary, complete regiments should have been de-

played on the OPLR, with their commanders, thus maintaining the unity of the tactical organization, of the combat and service effort. Further, the regimental staff would have been available to the task force commander, as would have been the communications means of the regiment.

The unity of tactical organizations was violated throughout the entire operation. A brief examination of Figures 2 through 8 indicates this clearly. There is justification for such mixed assignments and attachments during the period 10-14 July when forces were regrouping to counter the Japanese break-through. There is little justification for it otherwise. True, movement through the jungle to regroup forces into their tactical organizations was difficult. However, considering the moving about that *did* occur, this should not have been an impossible nor undesirable solution. In many cases, battalions of regiments were committed to reinforce the forces along the Driniumor when battalions of regiments, already committed, were still available in the Tadjia area. It is interesting to note that the 126th Infantry of the 32d Division was *never* committed to the main operation during 28 June—30 July, while two RCTs, one separate and one from another division, were. The fact that its commander was hospitalized most of this time should have had little bearing on its employment.

Full use was not made of the available intelligence information concerning enemy capabilities. Such information and enemy actions indicated clearly a Japanese attack, in force, on the center of the Driniumor line about 10 July. This was common knowledge to regimental, division, corps, and army commanders and their staffs. Despite this fact, the Driniumor line was weakened and forces sent on a reconnaissance in force on either side of the area from which it was estimated

the attack would occur. No reinforcement of the Driniumor line was made, although forces (32d Division less three battalions and the 124th Infantry) were available in the MLR. At the same time, no provision was made for a reserve force to move east of the Nigia River.

Reaction to the Japanese penetration on the night of 10-11 July was slow. Part of the reason for this was that no force was located east of the Nigia River other than those on the Driniumor. In view of the information available concerning Japanese capabilities, the weakening of the Driniumor line, and the time required to move troops, a force should have been located somewhere between the mouth of the Nigia River and either the Akanai or Koronal Creeks. Consequently, it was not until 13 July that the 124th Infantry was in a position to attack to close the gap driven in the Driniumor line.

Co-operation from the Japanese commander was excellent. Due to the casualties suffered by his forces and their subsequent disorganization, he did not advance immediately on the Nigia River but apparently attempted to reorganize somewhere between the River X and the Driniumor. Had the Japanese driven on to the mouth of the Nigia they could have cut the main line of supply and reinforcement to the United States forces east of the Nigia.

Fortunately, the Japanese commander, or his subordinate commanders, made more mistakes than did the American commanders. It is a matter of sober conjecture as to what would have happened had the Japanese 20th Division hit the south flank of the Driniumor line at the same time as the 41st Division hit the center (and if the 41st Division continued its push on to the Nigia River mouth).

This operation emphasizes the fact that one of the desirable attributes of a commander is his ability to maintain himself in the good graces of that fickle goddess, "Lady Luck."

Flexibility of organization is one of the characteristics of the armored division that so ably permits it to execute certain missions. In the Aitape operation, infantry battalions were employed, attached, and detached with the freedom usually

encountered when units of an armored division are committed to action. It worked; we won. Perhaps an infantry division is more flexible in its organization than is usually thought—or *perhaps it should be*.

July 1951

Those who feel that the successful solution to one conflict may give us the opportunity to relax and stay out of all the succeeding ones fail to recognize the avowed intent of Communist doctrine. We are face to face with a long-range struggle—a struggle in which the enemy will use all means—political, economic, psychological and military—to bring about our capitulation. This long-range struggle is a struggle for survival.

General of the Army Omar N. Bradley

The Combat Troop/Service Troop Ratio

Colonel Harrison Shaler, *Ordnance Corps*
Deputy President, The Ordnance Board

The views expressed in this article are the author's and are not necessarily those of the Department of the Army, the Army War College, or the Command and General Staff College.—The Editor.

NO COMMANDER in his right mind would attempt to increase the number of guns in an artillery battalion if, to obtain gun crews, he was forced to reduce the strength of his headquarters and service organization. Yet there are many competent soldiers who see nothing illogical in accomplishing the same end when the additional spaces can be obtained by the depletion of the other fellow's organization—upon which they are equally dependent.

In either case, the result is the same—an increase in demand with fewer people to supply it. In the first case, observation, communications, and fire control will break down. In the second, guns will be short of ammunition, men will be shy of rations, or some other service will be deficient. It will be only a matter of time until the excess gun crews—and perhaps more of the personnel—will be struggling with the fire control equipment or back with

the service troops handling ammunition, issuing rations, driving trucks, or otherwise helping support the remainder of the battalion.

This is not hard to visualize on the small scale used for the above example. It is less obvious on a large scale, but it is just as true. In spite of it, however, proposals continue to pop up for increasing the combat personnel of a task force by reducing its percentage of service troops and, further, by reducing the number of supporting troops in the communications zone. Arbitrary decreases have been made in the division slice in the face of increases in a division's equipment and fire power. In an article in *Armed Force* of 17 February 1951, General D. A. D. Ogden ably discusses the division slice. In particular, he points up the speciousness of the claims—repeated in Alsop's *Fables* in the *Saturday Evening Post* of 3 March 1951—that the Soviets can support a combat force with a fraction of the troops required by the United States.

Supply versus Demand

Actually, the balancing of combat *versus* service troops merely is an application of the law of supply and demand. The de-

The balancing of combat vs. service troops is an application of the law of supply and demand, in which the demands of one must be equaled by the support capabilities of the other. It cannot be altered by fiat

mands of one must be equalled by the support capabilities of the other, and that equality will establish itself in time despite any amount of tampering. It cannot be altered by fiat.

In the business world, when the demand for an item exceeds its supply, the users go short until, after some of them quit using it entirely, the demands of the rest can be satisfied by what is available. When supply is excessive, some of the producers fold up and head for the rest centers so that production is reduced, finally, to what can be consumed.

Militarily, the operation is, essentially, the same. The economic warning of imbalance—price—is absent, but frustration on the one hand or idleness on the other perhaps are even quicker indications of an undesirable situation than are rising or falling prices. Superfluous consumers and suppliers do not disappear from the scene, but quickly find themselves working the other side of the street.

Solid Balls versus 8-Balls

The principle can be illustrated easily graphically. Figure 1 shows a dozen billiard balls resting on a curved rack. The right half of the rack represents the combat area and the left half the service area. Combat troops are represented by the solid balls and service troops by the 8-balls.

The only way in which the solid balls can be kept on the right half of the rack is by providing support of equal weight, such as the 8-balls in the left half of the rack. Otherwise, half of the solid balls would be supporting the other half. It is obvious that nothing can be gained merely by transferring an 8-ball to the other side of the rack. It will be only a moment before the balance is restored, and the combat troops will be back in the service area assisting in the support of the remaining combat elements as shown in Figure 2.

A perfect example of the condition illustrated by Figure 2 occurred in the Moroccan invasion in 1942. Not a single

ammunition unit was included in the assault echelon. When ammunition companies did arrive, they found a combat engineer battalion engaged in the storage and supply of ammunition.

A transfer of 8-balls into the combat area, however, can be accomplished by decreasing the mass of the solid balls, by increasing the weight of the 8-balls, or both. If the solid balls are lightened by drilling out their centers—decreasing their demand—they will require less support. If the other balls are loaded by filling their "eights" with lead—increasing their capabilities—they will provide more support. The result will be as shown in Figure 3.

The heavier 8-balls provide a greater total support for the solid balls. The lightened solid ones require less support. The result is the movement of an 8-ball into the area with the solid balls, or, in other words, an increase in the number of combat troops with a corresponding decrease in the number of service troops.

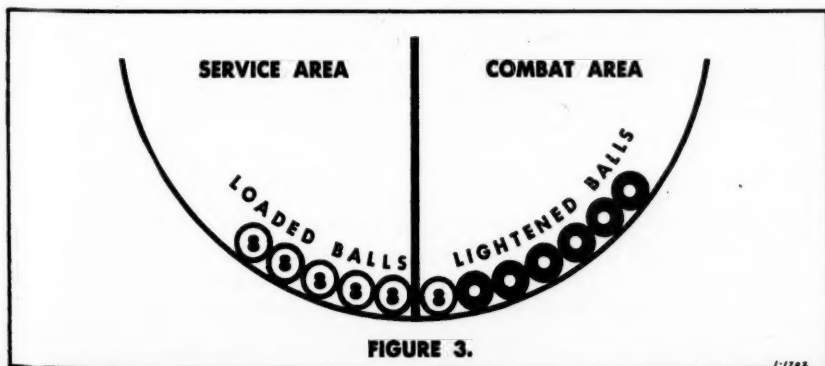
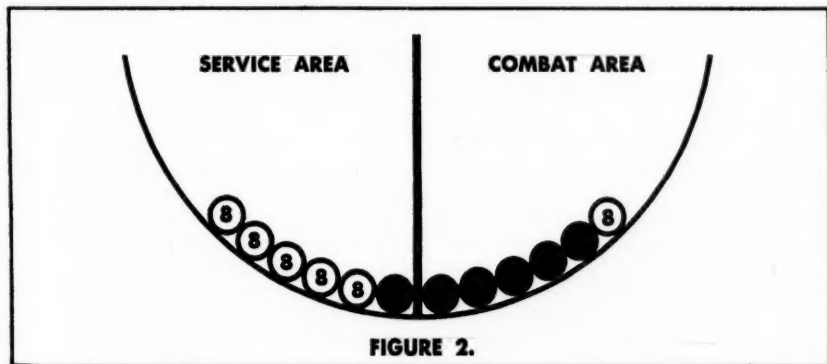
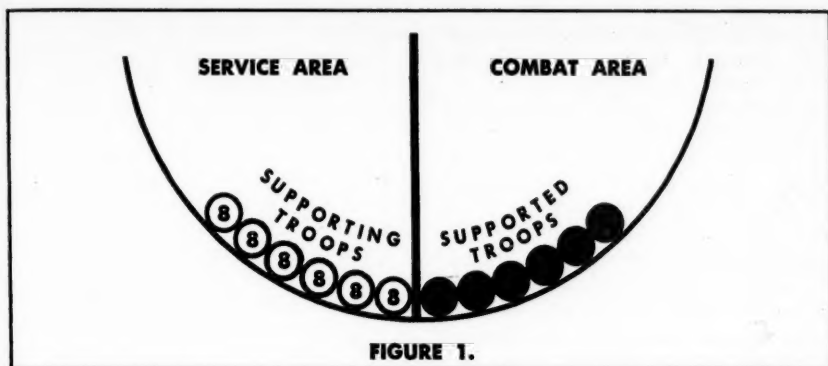
X/Y Ratio

The problem also can be illustrated by a simple equation. It is axiomatic that supply, or, to use the broader military term, support, must equal demand—ultimately, if not initially. If D represents the average individual demand of X combat soldiers, and C is the average support capability of Y service troops, then:

$$\begin{aligned} XD &= YC \\ \text{or } \frac{X}{Y} &= \frac{C}{D} \end{aligned}$$

In other words, the ratio of combat to service troops is determined by the values of D and C. Any reduction in D or increase in C will improve the X/Y ratio. Without such a change, neither X nor Y can be altered.

Any bettering of the X/Y ratio can be



accomplished only by attacking the values of C and D, since any arbitrary and artificial values of X and Y soon will adjust themselves to the values of C/D. Actions which would reduce D include dispensing with nonessential items; a reduction in excessive ammunition withdrawals, which will cut down losses through deterioration or returns to a depot; and a high standard of organizational maintenance, which reduces the demand for service from supporting troops. Steps which would increase C include any form of mechanization which will increase the tonnage of supplies that a man can handle and the designing of equipment so that maintenance can be performed in fewer hours.

In the constant endeavor to increase the X/Y ratio—something to be desired when considering any given situation—it is often over-looked that there are more forces (and constructive ones) at work to reduce the ratio than to increase it. Waterproofed, submersible vehicles, for example, require far more maintenance personnel for their upkeep than do conventional ones. Guided missile artillery and antiaircraft artillery units, equipped with the newest fire control mechanisms, need many more ordnance men behind them than do the standard artillery battalions of World War II. The support of a growing number of army aircraft is in addition to the other responsibilities of the ordnance service. The increased use of automatic and fast-firing weapons re-

quires more ammunition handling and transport.

All such developments represent an increase in the D factor and, necessarily, will result in a reduction of X or an increase in Y, with a lowering of the X/Y ratio. It is obvious, then, that fluctuations in the ratio, *per se*, are not good or bad but must be evaluated in the light of the changed effectiveness of the force as a whole. If, for example, the fire power of a division of a given size is increased, the division slice will have to be enlarged if only to provide for the greater tonnage of ammunition to be handled and transported. As a result, its X/Y ratio will fall. Nevertheless, as long as the increase in the slice is less, percentage-wise, than that of the fire power, an advantage has been gained.

Conclusion

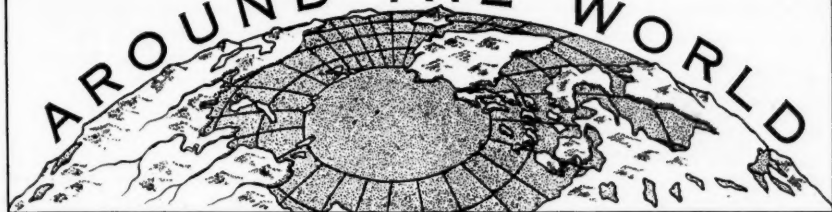
The service mission is not accomplished properly under arbitrary directives to do the "mostest" with the "leastest." It is done by designing efficient service units, determining their capabilities, and assigning a sufficient number of them to a force to handle the total load. Only on such a basis can the service complement of the combat elements be computed. Any change in the combat troop/service troop ratio of a force so planned can be made effective only by a reduction in the demand for service, or by an increase in the capabilities for support of the service units—all orders and directives to the contrary notwithstanding.

Mobility on the battlefield and to the battlefield is a "must" in our concept of fighting. It is largely because we can move men and equipment where they are needed at the decisive time and place that we feel confident we can defeat the probable greater mass of any future enemy's land forces.

Officers' Call

MILITARY NOTES

AROUND THE WORLD



UNITED STATES

Crash-Rescue Set

A tiny sending station that will be catapulted from crashed aircraft—and then be capable of bringing help from hundreds of miles away—is being developed as a joint project by the Army, Navy, and Air Force.

In the event of a crash, the small sending cylinder, which will be carried near the tail section to afford it maximum protection (the vast majority of crashing planes hit on the nose or fuselage), will be thrown out of the plane to a spot about 50 feet away. A trigger mechanism then will release a mechanical system which will right the container. A 20-foot antenna will be raised and a transmitter housed in the cylinder will start sending SOS signals hundreds of miles in all directions over a fixed frequency for 24 hours.

Air Rescue Service radio stations picking up these signals then can determine, by the triangulation method, where the plane went down, and rescue any survivors within a short period of time.

If the plane should ditch on the ocean, the sending set still will operate even if it is completely submerged in water. Gross weight of the final equipment is estimated at about 50 pounds.—Air Materiel Command.

Army's Newest Amphibious Vehicle

The Army has awarded a contract for the production of its newest amphibious vehicle, the *Otter*. This vehicle, designed to travel in mud, through water, or over



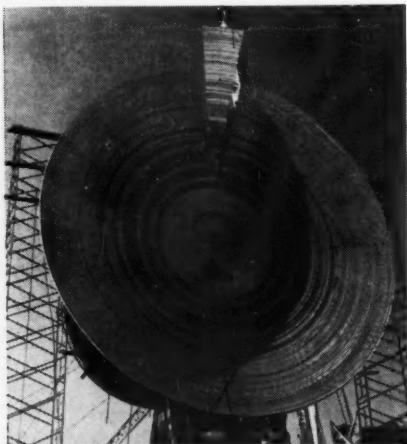
The *Otter* amphibious carrier.

snow or land, is a bigger and better version of the World War II *Weasel*.

The *Otter* can maintain a speed of 30 miles an hour on land, carrying a two-man crew and a number of fully equipped fighting men.—Department of Defense release and photo.

Radio Telescope

A new "radio telescope," 50 feet in diameter, has been installed on one of the Naval Research Laboratory buildings in Washington. Shaped like a salad



bowl, this aluminum reflector will be used to study radio signals from the sun, moon, and stars. It is expected to help radio forecasters predict more accurately when broadcasts will be blacked out, or when shortwave radio signals will come through clearly.—*Science News Letter*.

Muslin Parachute

A new expendable cargo parachute—made from strips of cotton muslin—has been developed by the Air Force. This chute will replace the old 24-foot rayon cargo delivery parachute and—in clusters of three or four—is expected to do the job of a 64-foot nylon chute currently used for heavy cargo drops.

The cotton chute, costing only half as much as a rayon chute, will deliver 500 pounds of cargo from a plane traveling 175 miles an hour. Its rayon predecessor could handle only 300 pounds at 150 miles an hour.—*Air Matériel Command*.

Jet Bombers in Korea

United States RB-45s (reconnaissance bombers), in the first appearance of such aircraft in any war, are being used to take long-distance pictures of Communist airfields and other bases in Manchuria.—News release.

'Electric Helmsman'

A device which will enable a ship to be steered by remote control from almost any spot on board has been developed by the General Electric Company.

This "electric helmsman," which is strapped to the user's chest, can be plugged into the steering control system at special outlets throughout the vessel.

It could be used in combat operations when normal steering stations have been disabled, for directing maneuvers such as docking, or for other emergency movements.—News release.

Bacteria-Free Plasma

Blood plasma going to wounded Americans in Korea now is being made free of all types of bacteria through a newly applied technique of killing the germs by ultraviolet radiation.

In the last War, plasma was not irradiated and many veterans suffered infections, particularly yellow jaundice.—News release.

New Fire-Control System

An improved radar fire-control system, which automatically will aim antiaircraft artillery, contains an electrical "thinking machine" that calculates where a shell should be exploded to bring an enemy airplane down, and automatically aims the gun to do just that.

The new system, now being produced for the Army, is an outgrowth of the electrical gun used effectively during World War II. It can be used for firing either the 90-mm or 120-mm antiaircraft artillery weapons.—*Science News Letter*.

Rocket-Firing Liaison Planes

Knocking out an enemy tank or troop concentration with rockets from an airplane is not too much of a trick. However, if the enemy has infiltrated between, behind, or around friendly troops, and has closed to within 100 or 200 yards, the problem develops entirely different aspects.

Under such circumstances: (1) pilots have difficulty in distinguishing friend

To equip an *L-19* to fire rockets is a relatively simple matter. The Navy zero-length launcher is easily adaptable to the wings of the plane. The Navy sight Mark VI, or any of its variations which are used on .50-caliber machine guns, provides adequate sighting and ranging equipment. The push button system of arming and firing the rockets is mounted in the cabin of the plane. Total weight



Tests have proved that firing rockets from troops is both possible and practical. Above, and foe, and (2) high-performance aircraft need a greater safety factor than 100 yards. Also, the beleaguered troops generally are not in a position to withdraw to "make room" for a conventional air strike.

In order to "fill the gap" in such situations, pilots at The Artillery School, Fort Sill, Oklahoma, have been experimenting with the possibilities of firing 5-inch rockets from *L-19* aircraft, and have proved that firing such weapons at targets that are within 100 to 200 yards of friendly troops is possible and practical.

It is not visualized that light planes will be armed to the teeth and go around hunting tanks as a sole mission. It is intended that they will fly their routine observation missions, adjust artillery fire, and make their normal reconnaissance flights. Then, if or when a target presents itself behind friendly lines, they can do something about it.

L-19 aircraft at targets close to friendly an *L-19* equipped with four 5-inch rockets. of all equipment, including four 5-inch rockets, is something less than 575 pounds.

The *L-19* is well suited for firing rockets because of its ability to fly at speeds of from 40 to 140 mph, and to remain airborne for 4½ hours without refueling. The slow speed allows the pilot to distinguish accurately between friendly and enemy troops, and the speed of 140 mph permits the plane to approach the target rapidly, fly a steady course, and make a "get away" before it is exposed to undue hazard.

The rockets may be fired singly, in doubles, or all four at once. Probably the best method is to approach the target firing one round at a time, adjusting the fire as the aircraft moves in closer. Using this method, hits can be obtained on a target the size of a tank. Experience shows that a tank can be hit on 80 percent of such attacks.—The Artillery School.

Liberty Ships

The Maritime Administration has announced that about 100 Liberty ships from the moth-ball fleets will be put into a program of hauling grain to India and other cargoes to Marshall Plan countries.—News release.

Mobile Power Plants

The Navy is preparing 11 mobile power plants, mounted in special railroad cars, to be used if major sabotage, bombing, or natural disaster damages existing power facilities at military establishments.

Each unit contains a Diesel-type 600-kilowatt generator and could provide at least the minimum amount of power for most establishments. The plants will be held on a standby status at naval installations spaced throughout the country, and can be rushed to any military installation in the event of an emergency.—*Armed Force.*

Army Aircraft

The Army National Guard is being equipped with *L-19s*, the latest type all-metal aircraft used for observation, wire laying, and other missions (MILITARY REVIEW, Dec 1950, p. 67, and Jul 1951, p. 69).

The new plane is replacing the *L-16*, a civilian-type fabric plane, presently used by Army Guard units.—News release.

Dredge to Aid Defense

The *Manhattan*, a dredge owned by the Army Engineers, is to be towed 12,000 miles to Bangkok, Thailand, to deepen the harbor there in order to expedite the flow of scarce materials to this country for the defense program.

The dredge is being taken over by the Economic Co-operation Administration and will be made available to the Government of Thailand, from which this country obtains rubber, drugs, tin, shellac, rice, tea, and tapioca.—*The New York Times.*

National Atlas

Plans are underway to publish what is expected to be the United States' first national atlas. The project, estimated to cost more than a million dollars, will be a definite aid to national defense. The need for such a map collection was demonstrated in World War II, when vital information had to be compiled from fragmentary sources.—*The New York Times.*

Stock Pile Gain Expected

The Economic Co-operation Administration recently forecast a vastly accelerated flow of strategic materials into the United States' stock pile in the next year as a result of foreign-aid development projects.

In the last 2 years, the agency has invested the equivalent of more than 50 million dollars in projects to increase the production of vital metals and other scarce materials in Marshall Plan countries. The loans are to be repaid in the form of shipments of the materials for the stock piles here.

Development projects under way cover such materials as aluminum, cobalt, copper, zinc, lead, nickel, tungsten, chromite, bauxite, and tin.—News release.

Steel Cartridge Cases

The Army has announced that it is going to make cartridge cases out of steel instead of brass to preserve strategic materials.

This is expected to save millions of pounds of copper and zinc in the course of large-scale production of cartridge cases for small arms and artillery ammunition.

The Army experimented with steel cases in World War II, but found that they tended to enlarge and split at the time of fire. Subsequent research has produced a steel case that performs as well as a brass case.—News release.

Police Training

Some 12,000 former North Koreans are being prepared for police duty under the Allies in North Korea. These men have been thoroughly indoctrinated in the South. Regarded as part of the Republic of Korea (ROK) military organization, they can be used north of the 38th Parallel along with regular ROK troops. If not so regarded, they could not be used, since a United Nations' directive is still in force, limiting the Korean Republic's civil authority to South Korea.—News release.

Military Aid

The millionth ton of Mutual Defense Assistance Program material, exclusive of flyaway aircraft and naval vessels, has been shipped abroad. The bulk of this equipment has gone to the United Kingdom, France, Belgium, Luxembourg, the Netherlands, Denmark, Norway, and Italy; with a lesser amount going to Greece, Turkey, and Iran; and the balance sent to the Philippines, Indo-China, Malaya, Indonesia, Burma, and Formosa. Major items of equipment include more than 1,600 tanks and combat vehicles, 750 major pieces of artillery, 6,000 general purpose vehicles, 600 aircraft, and 50 naval vessels and small craft.—*Army Navy Air Force Journal*.

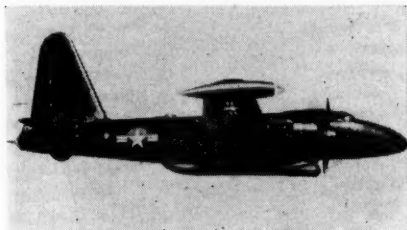
Poison Gas Eases Cancer Pains

The American Cancer Society has announced that more than 50 hopeless cancer victims gained relief from various symptoms of the disease after recent injections of poisonous mustard gases developed by Germany during World War II.

The society emphasized that none of the patients involved were cured. However, it added that all were relieved of symptoms such as pain, and that microscopic examination showed "large areas of the tumor centers" were killed and other cancer cells underwent changes.—News release.

Air Search and Rescue Plane

The Navy's prime antisubmarine plane, the *P2V Neptune*, has been redesigned for air search and rescue operations. The *Neptune*, which holds the world's record for long distance, unrefueled flight, can be equipped with skis and can carry a



The *Neptune*, with A-2 lifeboat attached.

droppable lifeboat under its fuselage, so that it can operate over water, land, or ice and snow.

The *Neptune's* high performance—its range of speed permitting both fast and extremely slow flight—is a requisite for the search and rescue mission. It can speed to the scene of a search, then slow its flight for detailed inspection of the area and to drop aid to survivors after they are located.—News release.

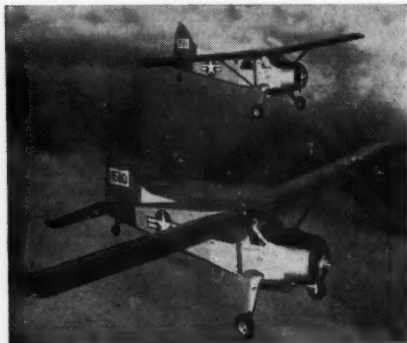
Improved Packaging

The packaging industry now is in a position to offer many innovations in shipping containers to the armed forces. Since the end of the War, this country has done a tremendous amount of packaging and shipping abroad, thus providing more information on this subject than had been possible in years before.

Among the improvements the industry now can offer include a vapor phase inhibitor. This is a paper, impregnated with a chemical that gives off a corrosion-preventing gas. In addition, the industry has improved grease coatings and a neutral cellulose wadding, which does not absorb water.—*The New York Times*.

Canadian 'Beaver'

The Air Force has started negotiations for the delivery of an undisclosed number of Canadian-designed DeHavilland *Bea-*



Two L-20 Beaver liaison planes.

vers—the winner in the recent liaison aircraft evaluation tests.

The high-wing, single-engine monoplane, designed especially for bush flying in the Arctic regions, has a top speed of 170 miles an hour, and can carry up to seven passengers including the pilot, or more than 1,000 pounds of cargo. It can operate with wheels, floats, or skis.—*Armed Force*.

Research and Development

More than a thousand college and university laboratories will be available for defense research and development projects. Plans are underway to survey various institutions to determine the status of research facilities and personnel available.

College and university research facilities will become more available for defense work as student enrollment is depleted by the draft. The schools are expected to seek defense contracts in an effort to hold their teaching staffs together during the emergency.—*Science News Letter*.

Faster Messages

The fastest communications method in the world was unveiled recently by the Western Union Telegraph Company. A message now can be sent at the rate of more than 3,000 words a minute, contrasted with the 300 words a minute transmitted on conventional systems.—*The New York Times*.

Medical Technique

An improved technique in the Army's treatment of broken leg bones, involving the use of a stainless steel pin which eliminates the need for a cast, has been tried out with satisfactory results.

Known professionally as the intramedullary bone pin, the device is inserted through the end of a broken thigh bone into and along most of the length of the marrow cavity.

When the fracture has healed, an incision is made at the upper end of the femur, and the pin is then withdrawn. Eventually, the cavity becomes refilled with marrow.

The new bone pin promotes faster growth of new bone tissue, permits earlier fixation of the bone, and avoids the stiffness of joints and muscular atrophy associated with immobilization of the leg in a cast.—*Army Navy Air Force Register*.

Antisubmarine Helicopters

After more than a year of experimentation, the Navy is convinced that the helicopter will be a potent antisubmarine weapon, and has placed an order for a machine specifically designed for antisubmarine work.

With its peculiar ability to stand still in the air or fly more than 100 miles an hour, the helicopter has marked advantages as a bearer of detection equipment and antisubmarine weapons.—*Army Navy Air Force Register*.

AUSTRALIA

Armed Forces

The Government plans to increase the Australian defense forces within the next 3 years by 118,000, the majority of the increase coming from persons to be called up in the National Service Training scheme. The strength of Australia's defense forces now is about 63,000. This comprises about 40,000 in the permanent forces and 23,000 in the citizen military and reserve forces.—*Australian Weekly Review*.

Naval Maneuvers

Ships from the navies of Canada, Australia, Britain, New Zealand, and Pakistan recently ended the longest and most realistic maneuvers ever held during peacetime in Australian waters.—News release.

CANADA

Arms Aid

The Netherlands and Belgian Governments have received enough matériel from Canada to equip an infantry division in each country. A similar shipment of arms and equipment soon will be sent to the Duchy of Luxembourg.—*The New York Times*.

BRAZIL

United States Freighters

Brazil will purchase 20 freighters from the United States to assist in the rebuilding of her merchant marine. The Government has been negotiating with American interests for some time on this purchase, and will secure additional ships at a later date.—*The New York Times*.

Oil Refinery

An oil refinery with a daily capacity of 20,000 barrels will be set up in São Paulo. This will be the fourth refinery in Brazil.—*The New York Times*.

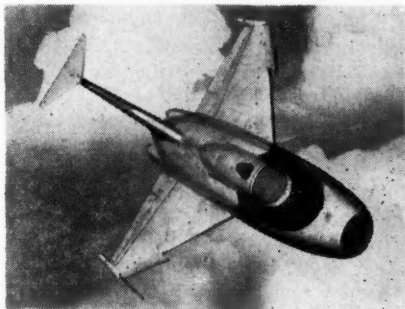
GREAT BRITAIN

Colored X-Ray Pictures

A British X-ray expert recently disclosed a method of making colored X-ray pictures through the use of three negatives. It is believed that this is the first time in medical history that color has been so applied.—News release.

New Delta Wing Plane

Britain's third delta wing research plane, the Fairey *F.D.1*, recently completed its first flight. Powered by a Rolls



The *FD-1*, newest delta wing plane.

Royce Derwent turbojet, the *F.D.1* is the smallest British jet now flying.

The plane is a single-seat monoplane, with a retractable tricycle landing gear. The span of the plane is 19 feet 6 inches, and the length 26 feet 3 inches. Performance data have not been released.

The two previous delta wing aircraft are the *Avro 707* and the Boulton Paul *P.111* (*MILITARY REVIEW*, March 1951, p. 69).—*The Aeroplane*, Great Britain.

Native Troops

The British Government soon will begin discussions with colonial and dependency governments within the Commonwealth on the chances of raising more colonial and native volunteers to help share the burden of common defense.—*The New York Times*.

JAPAN

Freighter Purchased

A Japanese shipping firm has purchased the Philippine freighter *Dona Nati*, the first foreign ship bought by the Japanese since the War.—News release.

LATIN AMERICA

Population Increase

A census of the Americas indicates that for the first time the population of the 20 Latin-American Republics is probably larger than that of the United States.

Still incomplete figures indicate the 20 Republics will show a population of about 152,800,000 compared with the official 1950 United States count of 150,697,361.—News release.

SOUTH KOREA

United Nations Aid

Twenty-nine United Nations countries have offered 21 million dollars worth of aid to South Korean civilians. In addition, another 200 million dollars has been pledged for reconstruction projects by United Nations agencies, governments, and individuals.—News release.

BELGIUM

Jet Fighters

The Commanding General of the Allied Air Forces in Central Europe recently presented three *Thunderjet* fighters to the Belgian Air Forces.—*The New York Times*.

WESTERN GERMANY

Army Units

Western Germany has proposed the formation of military units of 10,000 to 12,000 men instead of the previously suggested combat teams of 5,000 to 6,000 men. The Germans argue that the combat teams would be too small for an effective military organization.—*The New York Times*.

SWEDEN

Trade Pact

In a recent agreement, Sweden promised to supply Czechoslovakia with iron ore, steel, steel alloys, ball bearings, paper, chemicals, and storage batteries in exchange for sugar, hops, chemicals, cranes, commercial steel, textiles, glass, automobiles, motorcycles, and other industrial products.—News release.

DENMARK

Defense Pact

A joint Danish-United States treaty on the defense of Denmark's huge Arctic island of Greenland has been drafted and is now being studied by the two governments.

According to the draft, the new treaty will be valid for 20 years, and will succeed the Treaty of 1941, which gave the United States rights to establish naval and air bases in Greenland.—*The New York Times*.

THE NETHERLANDS

Defense Plans

The Netherlands Army recently disclosed that works were being constructed in various parts of the country to facilitate inundations in case of invasion.

The inundation plans are limited to strategic points as part of a general plan of flexible defense.—*The New York Times*.

YUGOSLAVIA

Arms Plants

Yugoslavia has decided to give the highest priority to the construction of new armament factories as a result of the serious military situation in the Balkans.

A great part of the new construction will take place in Croatia, with many of the factories being built in areas inaccessible to enemy attack.—*The New York Times*.

PAKISTAN

Defense Spending

Pakistan's Finance Minister has announced that that country will spend about half of its total revenue of 53 million dollars for defense in 1951-52.—News release.

MEXICO

Expansion Program

The Mexican Government has announced plans for a multimillion dollar expansion of its petroleum industry this year to make the Nation "safe and able to defend" itself in a world emergency. This program will be carried out as quickly as possible through large-scale oil and gas drilling, and refining and transportation projects.—News release.

EGYPT

Defense Budget

Egypt is to spend 21 percent of her 1951-52 budget on defense. The draft budget, recently approved by the cabinet, allots 44 million Egyptian pounds (\$120,120,000) out of a total 231 million Egyptian pounds (\$627,900,000) to reinforce the country's armed forces.—*The New York Times*.

VENEZUELA

Road Project

The Venezuelan Government has announced that it will spend 100 million dollars during the current fiscal year on new roads and on reconditioning old ones. This represents the largest amount ever spent by the Government on roads during a 1-year period.—*The New York Times*.

ITALY

United States Destroyers

Three US destroyers—the first ships granted to Italy under the Atlantic Pact—recently were handed over to the Italian Navy.—News release.

ARGENTINA

Argentine Jet

A new Argentine-constructed jet plane, *Pulqui II*, was demonstrated recently at Buenos Aires. The new plane, powered



The new jet-propelled *Pulqui II*.

by a Rolls Royce Nene engine, attained a speed of more than 620 miles an hour during the demonstration. Exact performance data have not been released.—*Aero Mundial Suplemento Argentino*.

GREECE

United States Ships

Two destroyer escorts, the *Slater* and the *Ebert*, were delivered recently to the Greek Navy. The *Slater* was recommissioned the *Eagle* and the *Ebert* the *Falcon* by representatives of Greece.—*The New York Times*.

INDIA

Trade Pact

India and Egypt have signed a 1-year mutual trade pact. Egypt will trade raw cotton, cotton yarn, gypsum, and flax in return for Indian tea, tobacco, oils, coffee, and iron and steel goods.—News release.

Atomic Pile

Construction of a small atomic pile for experimental purposes and for making radioactive isotopes is the immediate object of the Indian Atomic Energy Commission.—News release.

Foreign Military Briefs

The Lee-Enfield .303, Britain's basic infantry weapon for more than 50 years, will be replaced soon by a new .28-caliber automatic rifle.

The Royal Navy will have 18 aircraft carriers when its present construction program is completed. It had 11 carriers in service at its wartime peak.

The Soviet Union's great canal and hydroelectric projects are running into supply and transportation difficulties which threaten to put them behind schedule.

Helicopters for air-sea rescue and intercommunication between ships of the fleet have been adopted by the Royal Navy.

Sweden has announced that her industrial output is above prewar levels, and that imports and exports continue to show steady increases.

Resettlement of displaced persons throughout the world recently passed the 900,000 mark.

By the end of 1952, the Norwegian Air Force will be increased by 50 percent.

Recruits for the Australian Army now will be accepted at the minimum age of 17 years instead of 18.

India's first plant for the production of thorium, a potential source of atomic energy, will be finished within 4 months.

Squadrons of jet fighters will be joining aircraft carriers of the Royal Navy this year.

The United States recently approved a loan of an additional 10 million dollars for irrigation, flood control, and agricultural development projects in Haiti.

A director of the Krupp Steel Company has announced that Krupp has been commissioned to draw up plans for a steel plant in South Africa.

PERU

Gunboats

Peru has accepted delivery of two gunboats which were built for that country in Southampton, England. They will be used for patrolling the Amazon River.—*The Kansas City Star*.

WESTERN EUROPE

Steel Production

The free nations of Western Europe produced at least 47 percent more steel last year than the Soviet Union and all its satellites.

Crude steel production of the Western European nations totaled nearly 53,000,000 metric tons in 1950, as compared with the maximum estimate of 35,788,000 metric tons for the Soviet Union and its satellites.

The crude steel production of the United States totaled 87,723,000 metric tons in 1950. Thus, the combined steel output of the United States and Western Europe was more than 140,000,000 tons during the year, or almost four times as much as the output of the entire Soviet sphere.—News release.

CZECHOSLOVAKIA

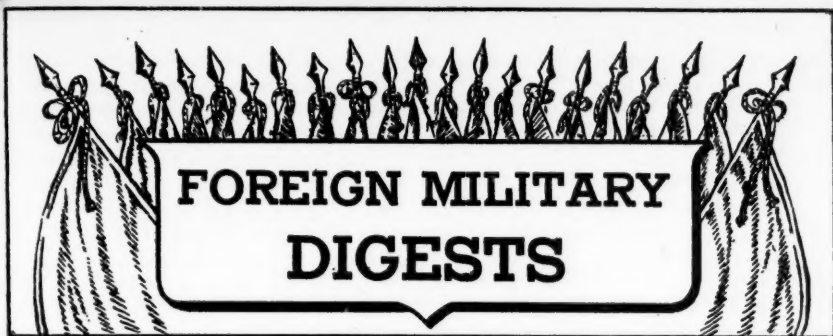
Production Lag

Czechoslovakia failed to fulfill her production plan for ore, oil, power, coal, and heavy machinery in the first quarter of this year, according to an announcement by the State Planning Office.—News release.

USSR

Missile Range

The Soviets are hard at work on a V-weapon firing range now nearing completion northwest of Liegnitz, Poland. The range is said to be between 4,000 and 6,000 miles long. Construction work is being done by Soviet soldiers only, with completion slated for August 1951.—*Aviation Age*.



The Evolution of the Armored Arm in Germany From 1935 to 1945

Translated and digested by the **MILITARY REVIEW** from an article in "Revue Historique de l'Armée" (France) December 1950.

THE Treaty of Versailles left Germany with an army of only 100,000 men, which was to possess neither tanks, aircraft, nor heavy artillery. In general, the *Wehrmacht* remained, for a period of 14 years, just as it had been organized in 1921. Nevertheless, the German General Staff tried to draw lessons from World War I, followed attentively the development of foreign armies, and took note of the doctrines which had been established. Troop training often was carried out with improvised equipment substituted for the forbidden weapons.

Following the withdrawal of Hitlerian Germany from the League of Nations, on 14 October 1933, the *Reichswehr* was dissolved and a new army was organized. At this time, whether to motorize and mechanize became the leading question.

Germans Applied Old Lessons

The successes obtained by the British at Cambrai, thanks to their tanks, had not been forgotten, nor had the victorious counterattack of General Mangin, in 1918, supported by 250 tanks. The important role played by the Allied aviation, when it had command of the air, also was remembered.

The tank, as well as the plane, was considered to be a weapon with a great future. Moreover, did it not now have its place in all the foreign armies, and also was it not considered as a possible successor of horse cavalry?

At the same time, the spirit of maneuver was reborn, and the war of movement again came into fashion and appeared likely to supplant, in the future, the static immobility which had characterized World War I.

The opinion of the German High Command was unanimous as to the importance of the tank, but opinions differed concerning the degree of mechanization and motorization that should be adopted. Some declared themselves proponents of total motorization and defended their concepts passionately; others, with equal fervor, refused to go that far and called attention to the fact that German industry was not capable of meeting the requirements of too high a degree of motorization. They maintained that the infantry always would have to bear the principal burden of combat and that, consequently, it should not be weakened in favor of other arms. Even the horse, in view of their limited gasoline

resources, should not be abandoned as a means of transportation.

Infantry Provided Major Role

Although everyone was in accord in admitting that fast motorized units gave a new impetus to offensive maneuver, only a few would admit that "slow" formations [on foot] would play only secondary roles in future warfare. The tendency was to make the infantry the pivot of operations as before, and the decision would not be made to give motorized units any other role than that which had previously belonged to the large cavalry units.

It was under these conditions that the new German Army was born. The infantry remained its core, while the number of motorized units remained limited.

From this time on, however, certain military minds, especially the younger officers, deplored loudly this important decision, and many of them believe, today, that it was the primary reason for the defeat of the German Army in the Russian campaign.

The constitution of a limited number of motorized units presented practically no difficulty. The dissolved *Reichswehr* had possessed a certain number of good cavalry units whose cadres—officers and noncommissioned officers—had been trained in a war of movement and had had ingrained in them the tactics of rapid combat.

However, the problem of the constitution of the new units still continued to exist. What would be the major "trump" of the modern cavalry; the armored vehicle (the break-through weapon) or the automobile (a weapon with speed)? The German High Command contented itself with the creation of rapid, tactical units, and the leading role was assigned to speed—shock power being given only secondary consideration. It was only when the Spanish Civil War had brought out the inferiority of the fast automobile with its insufficient armor that it was decided to begin

the construction of more powerful tanks.

In the matter of tactical concepts, it was accepted that the break-through should be effected by the infantry, then exploited by the mechanized units by means of bold encircling movements and attacks from the rear. For this reason, the motorized forces were constituted of mixed divisions comprising formations of tanks and units of motorized rifle troops.

The armored formations thus formed comprised:

- 1 armored brigade with 2 regiments and a combined total of 200 to 220 tanks.

- 1 brigade of motorized rifle troops (1 motorized rifle regiment, plus 1 motor-cycle battalion).

- 1 regiment of motorized artillery.

- 1 reconnaissance battalion.

- 1 antitank battalion.

- 1 engineer battalion.

- 1 signal battalion.

- 1 motorized antiaircraft artillery battalion.

- 1 aerial reconnaissance squadron.

In 1940, this organization was not effected in all the armored divisions, and, in view of the weaknesses encountered when engaging in dismounted action, it was decided to motorize a few large infantry formations to reinforce the divisions and, particularly, to cover their flanks.

Such was the condition of the German forces at the beginning of the campaign in France in 1940.

Ability of Armor Demonstrated

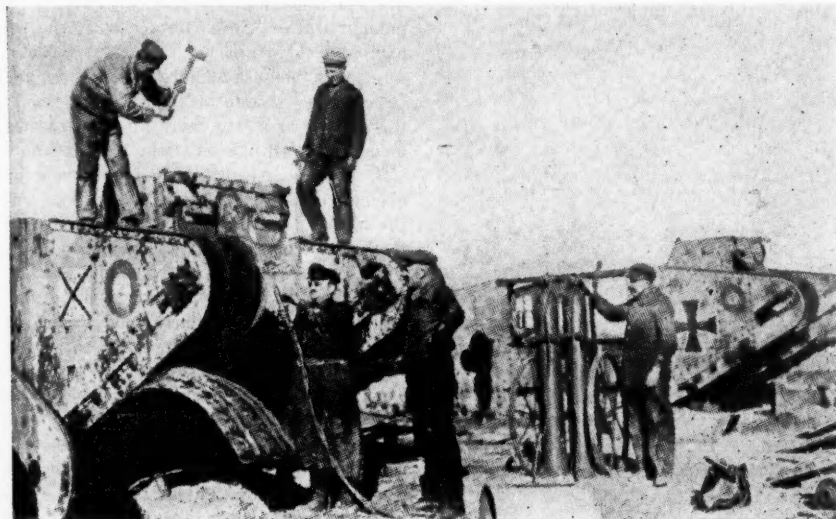
After the conquest of Poland, and in spite of the opposition of certain members of the German High Command who disliked the abandonment of the theories thus far accepted, the idea prevailed that the preparation and conduct of operations should be grouped around fast moving units.

These were the conditions that existed when the attack of May 1940 was formulated. Unleashed at a weak point in the

French front, it demonstrated the possibilities of the armored divisions in effecting a break-through and exploiting success.

The advantages of surprise, shock power, and speed were exploited under the

units were obtained under particularly favorable conditions. The field of operations was limited; the traversability of the routes was excellent; and the terrain was favorable. Seacoasts and mountain ranges constituted barriers which did not give



The Treaty of Versailles reduced the size of the German Army and eliminated its tanks, aircraft, and heavy artillery. Above, German tanks being scrapped after the armistice.

best of conditions, and led, in a minimum length of time, to a result which was not expected by the majority of German generals.

The *blitz* warfare had upset all previous strategic concepts. It was not the infantry, but the tanks, which had prevented the long war which generally was expected. The infantry did not break through the Maginot Line. The infantry was successful in its operations only after the armored units had attacked the line from the rear. The infantry's principal role was in tying down a large part of the French forces, but it was the tanks which carried off the decision.

On the other hand, it must not be forgotten that the successes of the armored

the French forces any chance for escape. Moreover, the French armored units were eliminated in the first phase of the operation by the mass action of German units.

Thus, 10 armored divisions decided the fate of France. The tanks had accomplished their task, and their equipment appeared to be satisfactory. But was this true? Already it could be seen that the equipment of the tanks was insufficient. The *Panzer II* was unusable and the *Panzer III* was inferior to the French *Somua* tank. Only the *Panzer IV* had given good results, despite the fact that the range of its 75-mm gun was too short and its power too weak.

The number of tanks in the armored divisions (220) appeared sufficient, but,

after long operations with the resultant high losses, this number proved inadequate.

The motorcycle units and the motorized rifle battalions, as long as the latter were provided with tracked vehicles, could be employed only for special operations. Because of this, the tanks often found them-



The "armored attack" as visualized by the *Wehrmacht* during its maneuvers in 1938.

selves without adequate protection and support. In addition, when the motorized rifle battalions were not equipped with tracked vehicles, they suffered from all the weaknesses of regular infantry units. Their employment in defensive operations was limited, for, despite their antitank weapons, they were not powerful enough to resist the attacks of the French tanks. When the situation became critical, they were obliged to call on the tanks to disengage them.

Lessons of the French Campaign

Thus, after the campaign in France, certain lessons of great importance had

been learned. These may be summarized as follows:

1. Tank units, in order to exploit their break-through capabilities, must possess large quantities of tanks.

2. The principal weapon of the armored units is the tank. Despite this fact, tanks must maintain close contact with the accompanying infantry. The latter must be numerous, possess armored protection, and be capable of operating in all types of terrain, in order to maintain its freedom of action in all phases of the tank battle.

3. The troops must be commanded by officers and noncommissioned officers of the highest caliber, who possess great tactical and technical knowledge. Such personnel must be qualified to command tank formations as well as motorized rifle units. Unless these conditions exist, armored units are of little value, and wear away rapidly.

4. An armored army, with modern organization and equipment, possessing great strength and highly qualified personnel, is capable of conducting independent operations, deciding a battle, and even a war.

The fundamental lessons drawn from these experiences, although significant, were, nevertheless, imperfect. The German High Command rested on the certainty that the young armored army had confirmed its value and formed an excellent tool for forcing victory in co-operation with a tried and tested infantry element.

Problems of the Russian Campaign

The Russian campaign, which was now imminent, would, as far as could be seen, present new problems. Russia's territory was as vast as the mass of her troops and population. The German road net and the status of supply were much worse than before. A rapid termination of the War was conceivable only with rapid, easy operations which could be conducted only by means of numerous armored units and a supply organization capable of functioning under difficult conditions. However, there

were serious reasons for thinking that Russia would be clearly outclassed, and that a few powerful blows would suffice to bring about her military and political defeat.

Although a few voices had warned that the Soviet Army was a factor which had to be regarded in a serious manner, the gravest mistake that a military commander can make was committed—the strength of the enemy was underestimated, and the strength of the German armed forces was overestimated. It was believed that, with the methods and means previously employed, a new *blitz* war could be conducted against the Soviet Union.

The armored forces were increased by 10 divisions, but to the detriment of their fire power. In the armored divisions, the armored brigades were replaced by armored regiments, which reduced the total number of tanks in the division from 200 to 180.

The motorized divisions, also reorganized, included two regiments of infantry with three battalions in each regiment, an artillery regiment, a reconnaissance company, an anti-aircraft battery, an anti-tank company, an engineer battalion, a signal battalion, plus service units.

While the armament of the tanks had been improved, such improvements were not very great. In addition, mechanized equipment was insufficient and heterogeneous, and the technical services were not capable of preventing the rapid deterioration of the tanks.

Due to the vastness of the Russian territory, the available armored formations were unable to operate independently, and the tempo of the operations was set by the infantry—not the armored formations.

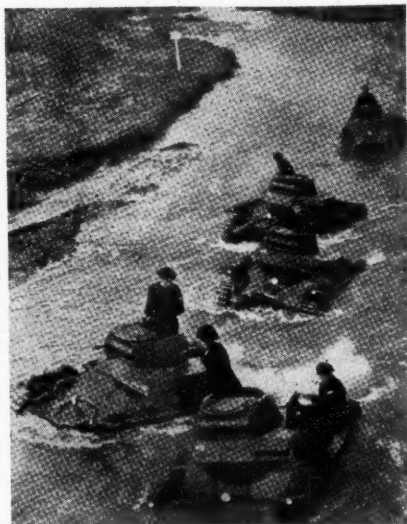
The Germans achieved success in several infantry-tank operations, but the infantry, after several months of hard fighting, became exhausted and reached the limit of its strength. In addition, supply activities could not keep up without great difficulty,

and the operations had to be halted. It was then that the mission to take Moscow and Rostov was assigned.

German Concepts Faulty

Nowhere appeared more clearly the false conceptions and the lack of foresight of the German High Command than in these operations—the first to be confided to armor alone. The Germans failed due to the weakness of the armored divisions. As a result, the Soviets were able to put fresh troops into the lines.

Nevertheless, the German armored arm had greatly outclassed that of the Soviets. The latter, at that time, did not possess



A river crossing operation by armored forces during the *Wehrmacht* maneuvers.

strategic armored formations, and used their tanks only in tactical operations in close collaboration with the infantry. The Soviet tanks were strongly armored and well armed, but they were heavy and slow. In addition, the Soviet tank forces were organized into small units, which made

them easy prey for the larger German formations.

As long as the Soviet infantry and horse cavalry had to carry the principal burden of the operations, superiority of maneuver remained in the hands of the Germans because:

1. The German infantry greatly outclassed the Soviets, from the standpoint of morale, training, and combat efficiency.

2. Initially, the limited space for maneuver permitted greater co-operation between the German infantry and tank forces.

3. The German infantry had nothing to fear from the Soviet tanks, which were being eliminated rapidly by the German armored units.

4. Initially, the Soviet infantry and cavalry were not serious opponents for the German armored formations, which were co-ordinated in their operations.

Infantry Endurance Limited

The decisive factor of the *blitzkrieg*—a continuation of the *blitz* operation, once it had started—was never applied in the different engagements of the summer of 1941. The physical endurance of the German infantry, despite its great contributions, was limited. Periods of rest between operations became necessary, and the Soviets took advantage of such situations to make a stand. Before being able to begin any new operation, it was necessary to renew the break-through attacks in which the fighting strength of the German troops was exhausted. With such procedures, it was easy to see that, with the inexhaustible potential of Soviet manpower, the balance would tip in favor of the Soviets.

To avoid this absurd war of attrition, it would have been necessary to modify the existing methods of combat. However, the German High Command could not yet resign itself to this fact. Perhaps it was already too late to consider any large organizational changes.

From that time on, the situation on the Eastern front remained tense. Elbow to elbow with the infantry, the motorized units were obliged to remain on the defensive; there were no fresh infantry troops to relieve them. In the spring of 1942, the motorized formations were replaced with infantry forces, but then there were no reinforcements for the motorized formations. Either the German High Command was responsible for this situation, or the German armament industry was incapable of delivering new matériel in sufficient quantities.

Nevertheless, in the spring of 1942, some of the motorized rifle units received new all-terrain, armored vehicles, and the equipment on the tanks was improved. The *Panzer IV* was re-equipped with a new 75-mm gun with increased range and penetration power, which made it capable of exchanging blows with the Soviet *T-34*. In addition, the supply of antitank weapons was increased, because the German infantry had shown that it was unable to hold its own against the increasing numbers of Soviet tanks.

During the course of the fighting, the motorized forces had as difficult a task as the armored forces, and their losses were higher. They were later reconstituted into panzer grenadier divisions and received a battalion of 60 tanks, an assault artillery battery, and an armored antitank company; altogether, 76 armored vehicles.

These new panzer grenadier divisions were given the same missions as the armored divisions, although the latter already had been recognized to be inadequate. Moreover, it was felt by many that this improvisation would lead to greater losses in obtaining the same result. Nevertheless, it was necessary to find a solution in 1942, for, if it were not found, the War would be lost.

Another Opportunity Missed

Once more a great offensive was begun in the southern part of the Eastern front.

If it had been prepared and executed correctly, Germany would not have been far from victory. Unfortunately, instead of employing all of the armored forces, only two panzer armies were used.

After having effected a break-through, the Germans continued on rapidly and pursued the Soviet forces. However, it was not a decisive operation, because the Soviets fell back toward the south and east and escaped annihilation. The German forces, with their gains of more than 600 miles, won terrain, but not the battle.

Never was certain victory thrown aside so lightly; never was a maneuver prepared with so little intelligence. A major pincer operation by the German armored forces, passing Rostov and Voronezh, would, in all probability, have broken up the Soviet's southern front completely. The Soviet forces would have been faced with a tragic defeat between the Don and the Donetz. The means were within reach, but they were not used.

A third time, in the spring of 1943, the armored forces again displayed their capacity for maneuver, when, after a retreat of more than 600 miles in the snow and ice, they counterattacked Soviet forces which had broken through on the north of Stalingrad and which had reached the banks of the Dnieper. The Soviet forces were annihilated between the Dnieper and the Donetz. Thanks to this action, it was possible to re-establish the situation on the German's southern front.

New German Tanks Appear

During the spring and summer of 1943, the German armored forces received, for the first time, a tank which outclassed the *T-34*: the *Panther*. It is true their number was limited, and replacements were slow in arriving at the front, but, with the elimination of the weaker types, the armament of the German tanks satisfied the requirements of battle.

In order to have a reserve of tanks, the Germans formed independent heavy tank

battalions equipped with the *Tiger*, an improvement over the *Panther*. However, it was an unfortunate idea to form such independent tank units, because they were thrown here and there into battle and used up very rapidly.

Soviets Gain the Initiative

During the critical year of 1943, the Germans attempted an operation at Kursk, which was conducted, to a large degree, by tanks. However, the essential element for an operation of this type—surprise—was lacking. This operation would have succeeded if the Germans had had sufficient forces to continue the drive, but again bad planning prevented a victory. From this moment on, the initiative passed to the Soviets, who retained it until the end of the War.

In 1944, except for the Ardennes offensive, the German tanks were employed, in the main, in the defensive. Wherever trouble appeared, they were there. They had been lowered to the level of a tactical unit.

The roles were now reversed. The Soviets were employing their tanks strategically—although not always skillfully—and the Germans were using them tactically.

It is not necessary, in this study, to devote much space to the campaign in France in 1944. It was characterized by the moral decomposition of the German armies of the West. They had neither the combat value, experience, nor morale of the troops on the Eastern front. They had insufficient tanks, and the units arrived too late and disorganized.

Armor Lacked Capable Command

The German armored arm, which could have played a decisive role, found itself in the hands of theoreticians with narrow points of view, and incompetent military leaders. In spite of its many successes, it was broken by a command which was behind the march of events. A foresighted organizer, who could have provided the

matériel means for retaining the initiative of operations, was lacking.

Only twice—in France in 1940 and during the Kharkov counteroffensive—was it under the orders of a military leader who was aware of its capabilities.

As for the Soviets, Stalin knew that the tank was the decisive weapon of war, but, initially, those in charge of the operations had no greater vision than did the German High Command. They committed

the same mistakes that resulted in the downfall of the Germans. It was not until the last phase of the operations, in 1944 and 1945, that the Soviets perfected their methods of using this arm.

The Russian campaign appears, in retrospect, like a war filled with missed opportunities. The cause of this was a false conception of modern warfare and a defective organization. May this serve as a warning!

The Army has become almost as dependent upon the automotive industry as have the Navy and the Air Force upon the shipbuilding and aircraft industries. Modern armies rarely march into battle. They move to the battlefield by motor truck, in tanks, or by air. And it is essential that when a break-through is made, infantry, artillery, and armor alike pour through the break with a speed and continuity that motors alone can give.

General J. Lawton Collins

The Royal Air Force of Today

Digested by the MILITARY REVIEW from an article by Wing Commander W. V. Crawford-Compton in "Norsk Luftmilitaert Tidsskrift" (Norway) February 1951.

THE Royal Air Force, with a present personnel strength of 200,000, is now well advanced in the process of rebuilding its front-line strength after the decreases which took place in the years immediately following the War. During these years, the peacetime tasks of the RAF have included important contributions to the cold war, culminating in the use of flying boat and transport squadrons to assist the United Nations' forces in Korea.

During the Berlin Airlift, RAF transport aircraft carried more than 350,000 tons of supplies to blockaded Berlin. At the same time, they were assisting the Army in the fight against Communist bandits in Malaya. The RAF contribution to this campaign included bombing and offensive strikes by *Lincoln*, *Brigand*, and *Spitfire* aircraft against bandit strongholds in the jungle, as well as supply dropping operations in support of security patrols operating far from their bases. A Helicopter Rescue Flight recently has been operating in Malaya, and it has proved invaluable in the evacuation of the sick and wounded. Casualties which in the past, have taken 2 to 3 weeks to reach base hospitals now are evacuated within 2 to 3 hours.

RAF Mission

In any future war, the task of the RAF, operating as a member of an Allied team, would be to guard Britain against air attacks and thus ensure the country's preservation as a base for Anglo-American air offensives. It also will be required to support Allied land forces on the Continent and to safeguard, with the Royal Navy, the sea approaches to the United Kingdom.

The RAF, as Britain's first line of defense, constantly is seeking means of increasing its efficiency.

All the day-interceptor squadrons of the Fighter Command are equipped with *Meteor* or *Vampire* jet fighters. The process of doubling the strength of these squadrons, which has been taking place during the past year, will be completed soon. *Meteor* 8 fighters are replacing the *Meteor* 4s and a more powerful development of the *Vampire*, the *Venom*, is in production for the RAF. Those who attended the Farnborough Display this year saw the *Meteor* equipped with Sapphire engines climb to 40,000 feet in just over 3 minutes.

In addition to the regular squadrons, there are 20 fighter squadrons in the Royal Auxiliary Air Force. More than half of these have *Meteors* or *Vampires*, the rest being equipped with *Spitfires*.

Night-fighter squadrons are still using the *Mosquito*, of wartime fame, but the *Meteor NF 11* is in production as a replacement. This plane should be in squadron service in 1951, and is being built in sufficient quantity not only to re-equip, but to expand, the night-fighter force.

In addition to the home-based fighter squadrons, most of the fighter and ground-attack units in overseas commands recently have been re-equipped with jet aircraft. Looking further ahead, important research work now is being conducted on an advanced air-to-air guided missile, designed to improve the effectiveness of the fighter against the modern bomber. Such a weapon will enable RAF fighters to attack and destroy enemy bombers at ranges far beyond those of their present armament.

Control and Reporting System

Another vital part of the air defense organization, the control and reporting system, which includes the radar sta-

tions and the communications and control network behind them, also is being modernized and expanded. It controls the movements of the defending fighters and passes information of enemy movements to the antiaircraft batteries.

Great emphasis now is placed on the ability of the RAF fighters to operate in all types of weather. Pilots are required to obtain an instrument rating before they receive their pilot's wings, and are expected to gain higher ratings during their squadron service. There is an annual competition among the fighter squadrons for a trophy awarded to the unit which makes the greatest progress in this direction, and the RAF as a whole is achieving a high standard of all-weather operation.

The Coastal Command

The task of safeguarding, with the Navy, the sea approaches to the United Kingdom falls on the Coastal Command, which still is equipped mainly with wartime aircraft, although some squadrons are re-equipping with *Shackleton* aircraft. These planes have been developed specifically for maritime operations. The Coastal Command also is working with the Navy in the development of new antisubmarine weapons and tactics.

The Bomber Command

The Bomber Command, at present, is equipped mainly with *Lincolns*, a development of the wartime *Lancaster*. As an interim measure, squadrons of the Bomber Command are being re-equipped with the *Washington* (the RAF name for

the *B-29*). Re-equipment with jet bombers were deliberately deferred until new types of jet engines could be developed fully and approved. The alternative courses of building a jet bomber contemporary with the present jet fighters, or a piston-engine type, larger and heavier than the *Lincoln*, would have produced, at great cost, an aircraft of limited and temporary value. There are now being developed for the RAF multi-engine jet bombers which will be capable of speeds, altitudes, and ranges far greater than those of current piston-engine types, and able to operate at something like twice the altitude and twice the speed of the *Lincoln*.

The first of these, the *Canberra* twin-jet bomber, is in production and will be in squadron service several months from now. In addition to their primary task of attacking strategic targets, these new aircraft, with their increased speed, will be less vulnerable when used in a tactical role in support of Allied forces on the Continent.

Readers will remember that the Royal Air Force, through the wisdom of its commanders, was not found wanting at the beginning of the last War and, indeed, was later able to withstand alone, for a considerable period, the full onslaught of the enemy air forces.

Now, 5 years after the disorganization that followed general demobilization, the RAF has been rebuilt into a tougher, more flexible, and more efficient fighting machine than ever before in its short but eventful history.

A General Survey of the Large-Scale Attacks on Helsinki During February 1944

Translated and digested by the MILITARY REVIEW from an article by Colonel P. Jokipalio in "Flugwehr und -Technik" (Switzerland) February 1951.

HELSINKI is located on a neck of land which reaches out into the Gulf of Finland from the southern Finnish coast. The geographic formation is such that within a distance of nearly 2 miles of the city there are only three or four islands suitable for the location of antiaircraft artillery batteries. However, to the east and west, at distances of $\frac{1}{2}$ to 3 miles from Helsinki, fairly large tongues of land reach out into the sea which are well suited for the location of antiaircraft artillery formations. These tongues of land are similar in form to that on which Helsinki is situated, so that it was possible to mislead enemy air formations and keep the attacks from the city.

The size of Helsinki, not taking into account the suburbs, is about 20 square miles. About 300,000 persons live in this area. Outside of the city proper, there are several major residential centers, but these could not be included in the air defense plan. The entire defense, potentially, had to be concentrated on the city proper.

In this connection, it should be mentioned that the city was not evacuated, for it was assumed that the Soviets would not be able to spare any forces for missions of secondary importance. This circumstance also explained the fact that the air defense, considering the nature and extent of the objective to be defended, was relatively weak.

The First Attack

During the early part of February 1944, it had been ascertained by radio that the Soviets planned a major operation with their long-range combat aviation. However, the objective of the operation was unknown.

On the evening of 6 February 1944, a dense ground fog covered Helsinki, but did not extend to the tops of the higher buildings. The weather was cold, and no wind was blowing. On the basis of previous experience, no attack was to be expected.

However, at 1850, the Air Raid Warning Service reported that Soviet planes were approaching from the direction of Hogland. Between 1910 and 2111, uninterrupted waves of enemy bombers, in groups of from one to eight planes, attempted to reach the city. These planes scattered east of the city in order to launch co-ordinated attacks from several different directions. The attack was repeated between 0100 and 0415. About 120 bombers took part in the first phase of the attack and about 70 in the last phase.

The major effort was made from the east, from a general altitude of from 13,000 to 16,500 feet, with bombs being dropped during gliding flight. The first waves of both attacks dropped numerous parachute flares to illuminate the target area.

The antiaircraft artillery fired almost uninterruptedly during both attacks, with the defense conducted, in the main, in the form of concentrated barrage fire. However, lead batteries which were equipped with radar gun-laying equipment were able to use aimed fire. Ground fog hampered the effectiveness of the searchlights. During the first phase of the attack, about 30 percent of the planes reached the objective. This was reduced to 10 percent during the second phase of the attack.

During these attacks, 70 persons were killed and 122 buildings were damaged.

According to civilian defense estimates, the enemy bombers dropped about 1,200 bombs, of which about 20 percent fell on buildings.

The Second Attack

The second major attack began 10 days later at 1955 and continued, without interruption, until 2315. As in the previous attack, the Air Raid Warning Service provided timely information as to Soviet intentions. The enemy bombers arrived in waves of from 2 to 20 planes, generally from an easterly direction, with a total of approximately 120 planes participating. Many waves dispersed, however, in order to attack from several different directions at the same time. The bombing altitudes of this raid averaged about the same as the attack on 6 February.

The attack was discontinued from 2315 until 2340, at which time the Air Raid Warning Service again reported the approach of planes from the direction of the Bay of Finland. This time, the enemy planes arrived in uninterrupted waves of two to three planes until 0543. In this second phase of the attack, approximately 300 planes participated.

The air defense was surprisingly successful, for only about 10 planes succeeded in reaching the target.

All things considered, the defense was conducted in the same manner as on 6 February. In both attacks, only 16 persons were killed and 27 buildings damaged. Out of the estimated 3,500 bombs which were dropped in this attack, only 70 fell inside the city area.

The Third Attack

Ten days later, at 1725, a warning report was received stating that enemy action was to be expected over the Bay of Finland. By 1730, the first air situation reports arrived, indicating that numerous waves of from 20 to 30 planes were

sighted on a westerly course. By 1815, some 130 planes had been counted.

The attack this time was more violent than the others and continued, without interruption, until dawn the following morning. Approximately 700 enemy planes participated in this action.

With regard to the conduct of the attack, three phases could be distinguished. The first phase lasted from 1843 to 2230. The enemy bombers approached the city in waves of from 20 to 30 planes, generally from an easterly direction. Individual planes flew ahead of each wave, dropping parachute flares to illuminate the target for the bomber formations. In this first phase, some 250 to 300 planes took part.

The second phase lasted from 2230 until 0230. This night phase was characterized by attacks by individual planes or very small formations. Defense was relatively easy, and only a few planes succeeded in placing their bombs on the target. Approximately 150 planes participated in this phase.

The third phase lasted from 0230 until 0505. This phase of the attack was conducted by waves of 2 to 10 planes. As in the first phase of the attack, individual planes flew ahead of each wave, dropping flares to illuminate the target. Approximately 250 planes participated, with attacks being made simultaneously from all directions. The bombing altitude of the enemy planes averaged about the same as in the two previous attacks.

Defense Problems

The defense forces had a difficult task during the attack on 26 February, for it lasted, without interruption, throughout the night. They succeeded remarkably well, however, for only about 5 percent of the bombs dropped fell on the target. Most of the planes which broke through the anti-aircraft artillery fire were in the first phase of the attack, due to its tempo

and the fact that the bombers approached from many directions at the same time.

During the first and second phases of the attack, it was difficult to maintain a clear idea of the situation. For this reason, antiaircraft artillery batteries in less important sectors were given a free hand to conduct the defense, while the other batteries were co-ordinated and their fires concentrated. The batteries which were equipped with radar gun-laying devices conducted aimed fire, while the other batteries formed barrages.

Since the weather was favorable, the searchlights could be used effectively with the result that night fighters succeeded in shooting down four planes and the antiaircraft artillery batteries were able, in many cases, to conduct their firing with optical ranging. Considering the strength of the attack, only 12 persons were killed and 70 buildings damaged.

Conclusions

Considering the strength of these three

main attacks on Helsinki, and the relatively small number of antiaircraft artillery weapons, radar, and night-firing equipment, the results of the defense forces must be regarded as good. Of the 12,000 bombs dropped during the three attacks, only 530 hit the target area.

The following factors, mainly, influenced the results:

1. Centralized control and co-ordination of the defense.
2. Continuous and detailed training both day and night.
3. Numerous and dependable signal communications.
4. Good defense discipline.

Regardless of the type of organization, and the quantity and quality of the matériel used in such defensive actions, the best results can never be obtained if the foregoing conditions do not exist. This fact was evidenced clearly not only in Helsinki, but also in the other areas of the Finnish home front.

Report on the Army of a Neutral Country: Switzerland

Translated and digested by the MILITARY REVIEW from an article in "L'Armée la Nation" (Belgium) January 1951.

SWITZERLAND does not possess a professional army; however, military service is obligatory. It includes 17 weeks of training at a recruit school for all men when they reach their nineteenth birthday, and an annual recall of 3 weeks until they reach the age of 36 years.

Every citizen who is not on the compulsory retirement list remains subject to mobilization, and keeps his gun, equipment, and uniform in his home. Except for the small cadre of 500 men (300 officers and 200 noncommissioned officers), the only professional military personnel in the country, all citizen-soldiers win their

gold braid or stripes during their training at the recruit school or during their annual recalls.

Mobilization Procedure

In case of an imminent threat to Swiss neutrality, the Parliament appoints a general to command the military forces for the duration of the mobilization. This appointment is based on the recommendation of the Chief of the Military Department [equivalent to the Secretary of Defense in the United States], and must be ratified by the Government.

In spite of its small population of 4½ million people, Switzerland is able to assemble an army of 700,000 men, by

mobilizing all classes eligible for recall into the service.

Thanks to the dial telephone, which



A guard detail marching through the court of honor at the Château du Colombier.

reaches even the most out of the way corners of the country, the men can be assembled at their military depots in less than 12 hours after the proclamation of the mobilization order.

This mobilization is likewise facilitated by the fact that none of the men have to travel more than 12½ miles to reach their assembly centers.

Defense Preparations

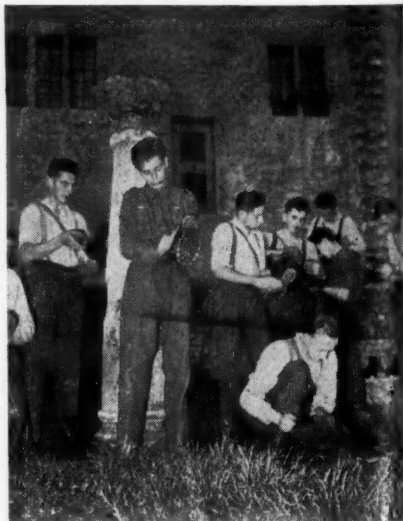
At the present time, the Helvetic Confederacy is making a great effort toward the modernization of its armament. The initiation of a 5-year plan, to begin this year, was aided recently by a greatly augmented military budget. To the Swiss, neutrality is not a synonym for pacifism, for they have always been ready, with all the resources at their command, to

defend the integrity of their territory.

An attack from the northeast would first encounter the Rhine River. One coming from the north or from the northwest would have to cross the Jura Mountains. Therefore, the Swiss strategy, which is neither new nor secret, would consist of putting into action, along the two lines represented by the Rhine and the Jura Mountains, all the means of defense at their disposal. Afterward, these defense forces would fall back, as slowly as possible, to the plateau which extends southward to the foot of the Alps.

In the case of an attack by forces strong enough to force her to abandon the Jura and the plateau regions, Switzerland would, nevertheless, still hold the master trump of the Alpine Redoubt.

At the present time, the Alps are a



Swiss militiamen polishing their shoes in preparation for an inspection at the center.

veritable beehive of tunnels, subterranean fortresses, artillery strong points, shelters, supply depots, hospitals, and

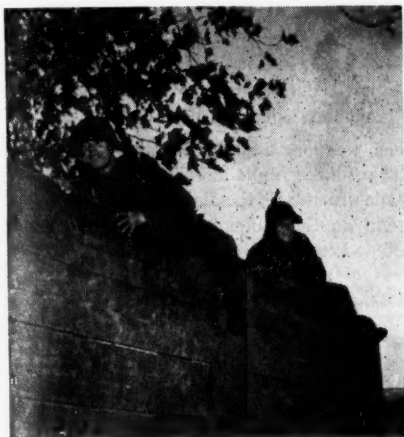
hangars for planes. In addition, all mountain passes are under cross fire, and the railway tunnels are mined, and can be blown up in order to prevent their use by an aggressor.

Because the service period is very short, it has to be organized in such a manner as to ensure maximum results in the training of the militiamen.

Colombier Training Center

The Château du Colombier is one of the principal training centers of the Swiss militiamen.

This castle, whose foundations go back to the Roman Era, is located near Neuf-



Two militiamen, American watch making students, training on the obstacle course.

châtel, in the watch manufacturing region of the Jura Mountains. Recruits and men taking refresher training at this center come from the cities of Le Locle, La Chaux-de-Fonds, and St. Imier, as well as from the wooded valleys of the Jura. Because of their common patriotic interests and trades, generally watch making, there is an atmosphere of good comradeship.

The medieval Château du Colombier has been modernized with the latest conven-



A Swiss soldier firing an antitank grenade on a training range at the Colombier.

iences in order to reduce fatigue duties to a minimum and ensure that the officers and their men have the maximum in comforts during their military service periods. As a result, they are well fed, well equipped, and well trained.

In this mountainous country, where



Swiss soldiers relaxing in the barracks during free time at the training center.

movements are often difficult, physical culture, sports, and even activities connected with existence in the mountains have an important place.

During the course of firing practice and drills, the handling of the most mod-



A corner of the officers' mess at the Château du Colombier training center.



A mess detail on duty in the enormous modern kitchen of the Colombier.

ern weapons and instruments is learned. The photographs accompanying this article illustrate the daily life at the Château du Colombier and the exercises conducted in its vast drill area.

The United States is pledged and determined, along with other free peoples, to check aggression and to advance freedom. Arrayed against the free world are large and menacing forces. The great manpower under the control of Soviet communism is being driven with fanatic zeal to build up military and industrial strength. We invite disaster if we underestimate the forces working against us.

President Harry S. Truman

The Role of Machines and Men in Modern Military Operations

Translated and digested by the MILITARY REVIEW from an article by Major General Kazimierz Glabisz in "Bellona" (Polish language military quarterly published in England) July-September 1950.

MAJOR General J. F. C. Fuller, one of Great Britain's outstanding military writers, stated, in his book *Armament and History*, that instruments or weapons, if used properly, constitute 99 percent of the causes for victory, while strategy, leadership, courage, discipline, supply, organization, and all other morale and physical factors account for the other 1 percent.

This idea was voiced by General Fuller influenced by the destruction of Hiroshima and Nagasaki through atomic bombing. He reacted in the same manner as did Archidamus of Sparta who witnessed the shooting of the first arrow from the Sicilian crossbow. Archidamus was led, at that time, to declare that, "The value of man has ceased to weigh in the scales of battle."

General Fuller, himself, showed how impulsive these estimates were when he voiced the diametrically opposite viewpoint a few months ago—obviously under the influence of the events of Korea. He laid aside the idea of the potency of the machine and announced, "Men and mobility . . . not machines and explosive means . . . win wars."

The inconsistency of these two ideas is obvious, although the first has reference to a special event and the second to war in general. Are not both of these ideas too extreme? Which of these two is closer to the truth?

There are two avenues of approach to the solution of these problems:

1. By examining the influence of man on the machine, and of the machine on man.

2. By examining the role of the machine and man from the point of view of the various forms of war or combat.

General Considerations

It is an obvious fact that an armed man has an advantage over an unarmed man. This is true whether it be only a club, a sling, or a lance. This advantage is increased the greater the reach or effect of the weapon. For example, a lance will disable one man; a high explosive shell, 10 or more; a bomb or poison gas, hundreds; and the atom bomb, tens of thousands.

The role of the machine (as a weapon of war) has continued to increase, while the role of man has decreased. This does not mean, however, that the role of man already has fallen from first to second place, for the role of the machine is dependent, to a very high degree, on the man himself, as well as on the weather and the terrain.

In connection with this dependence on man, on weather, and on terrain, the machine may be either a terrible and decisive instrument of battle or a troublesome burden. It may be a burden particularly at those times when the quality of the machine is replaced by quantity and when its handling is faulty.

Combat With Disproportionate Strengths

As a rule, the role of the machine in warfare will be greater when one of the opponents is weak from the technological viewpoint, and less when both opponents possess almost equal technological advancement.

Only in exceptional cases is the technologically weaker opponent able to resist or launch attacks. These exceptions would be possible, for example, when the stronger opponent:

1. Is not the master of his machines

(as was Russia in 1939-40 in Finland).

2. Does not receive sufficient fuel or ammunition (as Rommel in North Africa).

3. Is too cautious and methodical (as was Montgomery in North Africa and Italy).

4. Is unable to exploit his technological superiority, due to terrain or weather, and the weaker opponent is able to exploit his numerical superiority in manpower (as occurred in the first 10 weeks of fighting in Korea).

Normally, however, the opponent with technological superiority is the victor in battle—but not to the extent of 99 percent.

Combat Between Equals

The problem is entirely different when both opponents have relatively equal strengths. In this case, disadvantages in the technological field may be overcome by the advantages of better morale, better discipline, better leadership, and greater manpower reserves. However, it must be remembered that the unprotected man cannot save himself, even when he has greater courage, greater strength, and greater resistance, when he finds himself within the range of an atom bomb, a rocket, poison gases, or, simply, a bullet.

The human factor plays an enormous role in modern warfare when both opponents have relatively the same technological strength and technological advancement. This role becomes still more varied when we analyze its various elements, such as the morale of the front and the rear, the training level, command, endurance, discipline, and, lastly, the caliber of the men who are responsible for the direction of the war.

Contrary to General Fuller, "Fleets, armies, and air forces; conscription and militias; strategic railways; military academies; and generals, admirals, and statesmen still continue to occupy a respectable place"—in spite of the miracles of the laboratory and industry!

Conclusions

In the light of the foregoing considerations, we can deduce the following conclusions:

1. Every attempt at defining the military role of man and of the machine in percentages is useless. It cannot be calculated, nor can it be predicted.

2. Reliance, whether only on machines or only on men, is erroneous and dangerous, because the function and role of the machine is dependent on the attitude of man, and the attitude of man depends on his abilities, including technological strength.

3. The role of the machine will be greater as the numerical strength and technological advancement of the machine increase.

4. Even in push button warfare, which is still a long way off, final victory will not be won by the machine alone, even though its construction and exploitation be the best, as long as the weaker opponent has a minimum of the technological means to counter them and has the advantage from the standpoint of quality and quantity of men, of terrain, and climatic conditions.

5. The power of the modern means of warfare is terrible. Nevertheless, the role of man cannot be neglected nor reduced to microscopic importance, even when opponents have disproportionate strengths in the technological field.

The West in its defense preparations is placing its main emphasis on the quality of the machine in an effort to replace man with the machine. It is trusting in the potency of the laboratory, and in the efficiency of its techniques. The insistence of the West on a certain degree of comfort, even in time of war, lowers the quantitative efficiency of its gigantic production and cuts off from the battlefield too large a percentage of the men who are fit for combat.

The East, on the contrary, incapable of

equaling the West from the point of view of the quality (and in time of war, of quantity) of equipment, attempts to counterbalance this by the quantity and plainness of equipment. In addition, it is able to place on the battlefield large masses of fanaticized human robots. Caring nothing for the comfort of the man or for the high quality of equipment, it is able, to a great extent, to deprive the rear in favor of the

front, thus decreasing the technical disproportion.

In the event of a conflict between the East and the West, the superiority of the "machine-man" factor will decide the issue, in spite of Archidamus, centuries ago, and General Fuller, in 1945 and 1950.

Neither man nor the machine alone is supreme. Their ideal union is and will long be the king of battle.

Psychology and Learning

Translated and digested by the MILITARY REVIEW from an article by Lieutenant Colonel Antonio M. Coimbra in "A Defesa Nacional" (Brazil) December 1950.

PSYCHOLOGY embraces a wide field, but of special note is its influence on teaching and didactics—the art of teaching. It is difficult to understand why it should be ignored by those who, due to their professions, are teachers and students.

Psychology, in its objective form, is the science which studies man as a being—the *why* and *how* he performs. It is a study of his senses; his reactions and aptitudes, alone or in groups; and requires as complete a knowledge as possible of his make-up, his behavior, his abilities, and his capabilities and limitations. In other words, this means that we must understand what man is able to produce, and what can be required of him.

Man is, in the final analysis, the most perfect machine yet created; extraordinarily complex, sensitive, and precise; capable of perceiving, feeling, remembering, learning, thinking, and acting. The study of these faculties determines, psychologically, the corresponding capacities which are characteristically and inherently his.

The instructor is interested, primarily, in the learning faculty, and, from this standpoint, one cannot deny that it is through the five senses that man acquires his variable and individual capacity to learn.

Knowledge of Learning Capacity

Therefore, there is need of a complete and precise knowledge of all that refers to the learning capacity of the human senses. Then we shall establish the basis of an objective and rational appreciation of the human machine. This knowledge should be used to classify, to give appropriate instruction, and to exploit the learning ability of the various types of individuals. From this results a specialized psychology, one particularly adapted for the end we have in view—learning—and known as the psychology of learning.

What do we mean by learning? Learning is the ability to know how to do things the right way. Therefore, it is impossible to *learn* the wrong way, because he who learns incorrectly does not learn. Nor does it make sense to *teach* incorrectly because he who does so is not teaching, in the accepted sense of the word.

Learning is, therefore, a process of integration and selection; it is the ability to do things right.

Interest an Important Aspect

There is no doubt that interest facilitates understanding. In addition, repetition is indispensable to learning. Therefore, the principles of motivation, understanding,

and application, together with an adequate exploitation of the senses, constitute the pillars and the framework of learning.

To motivate means to interest; to awaken the desire to learn, so that the student will participate interestedly in the subject. In short, it will make the learning process simple, attractive, and suggestive. Motivation reaches its highest point when the student believes that *he is learning what he wants to learn.*

However, will it be possible to interest someone who cannot understand that which we want him to learn? Not necessarily! Understanding develops and complements interest. To understand is an integral principle without which motivation is sure to fail. It is by association, by the logical and rational sequence of ideas, and by going from the simple to the complex, from the known to the unknown, and from the concrete to the abstract, that the teacher not only wins the admiration of the student but also attains and establishes the reason for the existence of teaching—learning.

However, the mere awakening of interest is not sufficient to cause the student to learn. Understanding requires the instruction to assume different forms, so as to integrate methods and processes in a vehicle which is capable of obtaining maximum results.

Motivation and understanding are closely related and necessary for learning. It would be easy to make them an

integral and permanent part of the student were it not for the faculty of forgetfulness found in the human machine. Only practice, through repetition, eliminates the inconveniences resulting from forgetfulness. Thus, practicing by repeating, but repeating in a timely and intelligent manner, without tiring or losing interest, is one of the best ways of ensuring that the learning process is adequate and that the lessons learned will be retained permanently.

Conclusions

The foregoing considerations constitute nothing more than the basic pedagogic principles. Therefore, in the planning, the execution, or the supervision of teaching, the instructor should never forget to enforce these basic principles which always give excellent results, and which cannot be repeated too frequently:

1. Select what to teach with meticulous care. Separate the superfluous from the necessary. Adhere to the basic ideas.
2. Go from the simple to the complex, from the known to the unknown, and from the concrete to the abstract.
3. Interest the student in learning and make him discover what you want him to learn.
4. Arrange your ideas so that they will be understandable.
5. Repeat, as often as necessary, what should be remembered.
6. Act on the susceptibility of the students. Keep their morale high.

None of us looks forward to the catastrophe of war with eager anticipation, but there is no more noble a profession than that of the man who dedicates his life to be ready—amply ready—when his nation's existence depends upon his skill to meet that catastrophe, to confine it and to resolve it in victory.

Admiral Forrest P. Sherman

Anzio and Its Lessons

Digested by the **MILITARY REVIEW** from an article by Colonel G. R. D. Fitzpatrick in the "Journal of the Royal United Service Institution" (Great Britain) August 1950.

IT SEEMS that major military defeats are extolled and examined in minute detail while minor defeats escape attention. Possibly this accounts for the lack of published comment on the Anzio landing, although operations of this type are interesting and often provide valuable lessons. Certainly, there can be little doubt that the Anzio landing was a failure; indeed it only narrowly escaped being a major military disaster. The expedition was launched against the enemy's rear with the hope that its arrival would cause him to stampede from his main position: it was envisaged that the main body would join up within a matter of days or weeks. In fact, the Anzio force was isolated for 4 months during which time the British and American casualties numbered 30,000.

It is the intention of this article to examine the planning of this operation and, if possible, to determine the causes of failure. The broad strategic concept of an early capture of Rome will not be discussed; nor will the tactical actions of the actual battles in the beachhead be considered.

The Original Plan

In October 1943, it was decided that an effective way of maintaining the momentum of the advance on Rome was to send a sea-borne force round the enemy's right flank. The availability of landing craft limited the size of this force to one reinforced division, and the latest date for launching the operation to 20 December. The plan was related closely to the operations of both the United States Fifth and British Eighth Armies. The Eighth Army was due to attack first. The amphibious attack was not to be

launched until the main body of the Fifth Army had reached the line Priverno—Ferentino. At this time, the one reinforced division was to be landed at, or near, Anzio and establish itself on the high ground at Colli Laziali, dominating the enemy's communications. The distance from Ferentino to the high ground is only 27 miles by road.

It will be noted that the distinctive characteristics of this plan were, first, that the launching of the amphibious outflanking operation was to be contingent upon the successful advance of the main body of the Fifth Army; and, second, that the detached force would be operating sufficiently close to the main body to ensure that the enemy could not react to this threat without detriment to his main defensive effort. At this time, it was envisaged that the enemy would not make any attempt to stabilize the front south of Rome.

On 1 December, the Fifth Army's main attack began, but by 10 December it became apparent that the enemy had no intention of continuing his steady withdrawal. In addition, heavy fighting would be necessary to secure the entrance to the Liri Valley, let alone to advance up the valley as far as Ferentino. On the southern end of the front, the flooded Garigliano constituted a formidable obstacle. Thus, it was clear that the Anzio plan could not be implemented on 20 December, and, as sufficient landing craft could not be left in the Mediterranean Theater after that date, the plan was abandoned. Up to this time, planning for the amphibious assault had been carried out by Headquarters, Fifth Army. It is of interest to note that as early as 10 December, it was considered at Headquarters, Fifth Army,

that a landing at Anzio by a larger force could be undertaken independently of the operations of the main body of the army. There was, of course, no question of the project being put into operation at that time in view of the shortage of landing craft.

The Second Plan

Operations in the Italian Theater were given a new stimulus by Mr. Winston S. Churchill at the Christmas Day conference at Carthage. It was decided here that every effort must be made to advance our front in Italy to capture Rome and to obtain depth in front of the Foggia airfields. The Fifth Army was to attack across the Garigliano and Rapido Rivers, and an amphibious assault was to be made at Anzio. Once again, the Colli Laziali was to be the objective of this expedition. As a result of a further examination of the availability of landing craft, the latest date of the assault was fixed at 20 January 1944.

The composition of the assault force was as follows:

Headquarters, United States VI Corps.
Corps troops.

British 1st Infantry Division, plus one armored regiment.

United States 3d Infantry Division, plus one tank battalion.

504th Parachute Infantry Regimental Combat Team (US).

One Battalion of Rangers (US).

One Special Service Brigade composed of two British Commandos (each equivalent to a battalion in size).

The integration of British and American forces at the corps level is noteworthy. Never before had this been attempted, and subsequently, during the planning for Operation *Overlord*, it was deemed to be impracticable because of the radical differences in the administrative systems employed by the two armies. Furthermore, at that time, the ignorance of the majority of British officers of

American techniques was only equalled by that of the Americans of British methods. For excellent and varied staff reasons, the British 1st Division and the United States 3d Division were most easily made available, but it has been said that Mr. Churchill himself had insisted that the British should be fully represented in such a hazardous and momentous operation. Despite the difficulties, the planning and execution of the landing were carried out in the record time of 22 days, and the landing went off without a major hitch. This, in itself, is one of the most remarkable features of the operation.

At this point, it may be worth while to consider the differences between the original and second plans. In the latter case, the amphibious assault was to be launched whether or not the operations of the main body of the Fifth Army succeeded, and, thus, there was a possibility, even a probability, that the expedition would be isolated for several weeks. On the other hand, the size of the assault force had been doubled.

At an early stage in the planning, it was realized that provisions must be made for sea-borne maintenance for a possible protracted period, and also for the lift of at least one follow-up formation. The Christmas plan had envisaged that the shipping and craft would only remain available for 8 days after the assault. On 8 January, there was a further conference with Mr. Churchill where it was decided that additional landing ships could be retained until the end of February.

Throughout the planning period, there was intense preoccupation at the higher levels with the question of availability of ships and craft. It was not just a question of postponing their return from the Mediterranean to the home station, but also of commandeering ships en route home from the Far East.

In the meantime, the detailed tactical plan of the assault was being developed by Headquarters, VI Corps; the initial planning having been undertaken by the staff of the Fifth Army. In fact, there were few modifications of the army plan except regarding the employment of the paratroopers. At first, it was intended that they should be dropped a few miles inland on to one of the early objectives of the assaulting infantry. However, the risk of confusion was thought to be too great and, eventually, it was decided that they should be brought in by sea. The two British Commandos were added to the order of battle quite late in the planning.

The plan provided for an assault landing by two brigade groups of the British 1st Division, and by the Commandos, on the exposed beach west of Anzio; by the Rangers and one parachute battalion on a small beach close to the port itself; and by the United States 3d Infantry Division, deploying all three regiments, on the main beach east of Nettuno. Subsequently, the balance of the British 1st Division, and corps troops, were to be landed, while one regimental combat team of the United States 45th Infantry Division and half of the United States 1st Armored Division were designated for the follow-up.

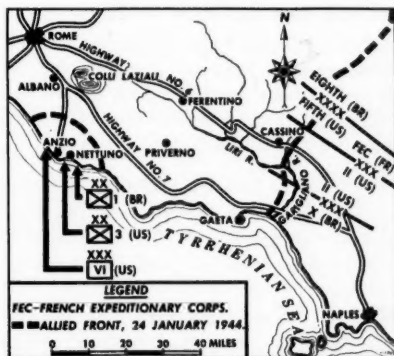
Before the actual assault, there was no detailed planning for the development of operations after the capture of the beachhead, roughly an area enclosed by an arc of about 11 miles radius with its center at Anzio. The Colli Laziali feature, however, always was regarded as the final objective. The omission of this stage of planning was not accidental.

The Assault and After

On 17 January, the British X Corps attacked across the Garigliano and met with limited success. A bridgehead was secured, but further progress was found

to be impossible. Later, on 20 January, the United States II Corps attacked across the Rapido and was almost immediately compelled to withdraw. Thus, the attacks of the main body of the Fifth Army showed little promise of success by 21 January, the day on which the Anzio force was due to sail.

The expedition had been mounted in the Naples area and sailed on the morning of 21 January. After an uneventful



voyage, the assault force arrived off the Anzio beaches during the night. The leading craft touched down at 0200 on 22 January, exactly on time. The opposition was negligible. Due to the effectiveness of the air forces and the efficiency of the cover plan, surprise had been complete.

By 23 January, both divisions had completed landing and the beachhead, as planned, had been occupied. On 24 January, an armored reconnaissance patrol from the 24th Guards Brigade advanced to within 3 miles of Highway 7, took a few prisoners, and withdrew. Nothing stronger than light reconnaissance patrols were allowed beyond the beachhead perimeter, and the tanks were retained in reserve to deal with the expected counterattack. On 25 January, the

British 1st Infantry Division attacked up the Albano Road and the United States 3d Infantry Division attacked toward Cisterna. By now, however, the enemy had had 3 days in which to concentrate their troops, during which time they had not been molested seriously by ground forces. The rate of enemy build-up had been astonishingly quick. It is estimated that by 24 January, there were 40,000 enemy troops within striking distance of the beachhead. By 29 January, this number had been increased to 70,000.

It is since clear that, after 24 January, there was no hope of reaching the objective without engaging in a major battle. It is equally clear that there was little opposition during the first 2 days.

The Lost Opportunity

It is easy to say, "If only the commander had planned for the exploitations of his first success and had seized his opportunity, all would have been well." On the other hand, it is far from easy to determine the precise influences which caused him to do otherwise. In attempting to do so, there is a grave danger of oversimplification. In practice, a commander is influenced, not so much by a series of independent factors, but by the balance and interplay of all the factors which merge to form a general impression.

From the brief narrative of the background and planning of the operation it will be seen that the concept of its conduct developed considerably from the first October plan. In that plan, one reinforced division was to be used to land and seize the Colli Laziali. There was to be no question of prolonged maintenance of an independent force, as the division would not be landed until a link up by the main body could be achieved without undue delay. Similarly, there was no question of a methodical process involving the capture of a beachhead, followed by a build-up

and a break-out. Speed was implicit in the whole project. Possibly because this was so obvious in the first case, the need for speed was not specifically stressed when formulating the aim of the final plan. This aim was the same as that of the first plan—to establish a force on the Colli Laziali feature which dominated the enemy's communications behind his forces opposing the main body of the Fifth Army. Once this feature was in our hands, there was every hope that the enemy would be compelled to loosen his grip on his main defensive position. On the other hand, a threat to this dominating feature was a less serious matter for the enemy, if he could occupy it first. Then, he would be established on the good ground, dominating the force which threatened him. Success would, therefore, most likely attend the side which could first occupy the Colli Laziali feature in strength.

It has been shown that, in the second plan, the amphibious force was to be launched independently of the success of the attacks by the main body, and indeed these attacks had not met with any marked success by 22 January. In fact, the VI Corps' operation was to be a miniature invasion, allowing time for the consolidation of the beachhead and build-up, and, incidentally, allowing time for the enemy to occupy the objective in strength.

No Plan for Exploitation

There was no plan for the rapid exploitation of initial success. There probably are several reasons for this course of action. First, it was believed that the enemy forces in the assault area were greater than they in fact were; second, the hazards of a winter landing were so great that it would have been unwise to rely to any large extent on the landing plan; and, then, Headquarters, VI Corps, had been involved in some heavy action in the Salerno beaches, and, thus, the

staff was convinced that the landing would be heavily opposed.

One may wonder why higher headquarters did not insist on exploitation planning. Doubtless, there was a proper reluctance to interfere in the tactical battle. Also, as has been said, their staffs were thoroughly preoccupied with the important business of collecting shipping and craft.

On the other hand, one must consider the attractions of deliberately consolidating the beachhead before advancing inland. An amphibious force is most vulnerable to effective counterattack during the early stages of a landing, before adequate reserves of troops, heavy weapons, and ammunition have been brought ashore. Unless the force is well positioned to sustain this first counterattack, it is in danger of complete destruction. Furthermore, a corps of two reinforced divisions is not a large force with which to make an incursion to a depth of 20 or 30 miles. After troops have been allocated for the close protection of the beaches and port, and for flank protection, little is left for the forefront of the battle. This is a strong argument for waiting for the build-up formations.

It also must be realized that very heavy air attacks had been made on the enemy communications north of Rome. While no man can guarantee the success of an interdiction program, there was every reason to believe that the enemy would find the greatest difficulty in moving reserves from the north. In this case, he would only be able to react to the landing in the early stages by weakening his main defensive front. There was, therefore, a chance that the desired effect could be achieved without ever occupying the Colli Laziali feature.

Chances for Success

It may be useful to examine whether or not there was ever any possibility of the expedition, as constituted, meeting with

success. Here, one is in the realm of pure guesswork, but it seems reasonable to assume that the chance of success would be conditioned by two factors—the degree of enemy resistance to the landing, and the rate of enemy build-up. In the light of events, it is fair to say that even had there been some opposition to the landing, and had the enemy build-up been considerably slower than, in fact, it was, there was a good chance of success by the method actually adopted. As against that, with a complete lack of resistance to the initial landing, but with a rapid enemy build-up, there may well have been a good chance of stampeding the enemy northward from the main position, if the Colli Laziali had been occupied even by weak forces. There is little doubt that this could have been done during the first 2 days. It is probable that the columns which penetrated to the objective would have sustained very heavy casualties. However, these would have been infinitely less than those ultimately suffered in the beachhead and Liri Valley battles.

The claim that the early arrival of small forces in the area of the objective would have caused a general withdrawal of the enemy is admittedly speculative and open to challenge. It is based on the actual initial reaction of the enemy on the morning of 22 January, when there was considerable movement northward, and on the almost invariable effect of troops operating in enemy rear areas. The general chaos and panic that can be caused by small detachments in this situation is well known. It must be realized that the area of the beachhead, although well in rear of the enemy front line, was not in fact the enemy "rear area"; that is to say it did not straddle his lines of communications, nor were any of his installations located within it. The beachhead did constitute a threat to the enemy's "rear area," but it was overlooked completely and capable of be-

ing neutralized, if time were allowed to the enemy to move his reserves.

Conclusions

To extract the broad lessons from the Anzio operation is admittedly an ambitious task. However, it is believed that the four points which follow were critical at Anzio and are capable of a wider application:

1. In an offensive operation, the factor of speed, which is the inverse of time, is usually of great importance. If the aim is to be defined fully it will often be necessary to specify the element of speed. In the case under discussion, it would have been of advantage if the need for speed in capturing the objective had been stressed consistently.

2. An offensive operation should be planned in its entirety. The commander

should visualize clearly every phase of the battle. This is not to say that the later phases will be planned in the same detail as the assault itself, but it is imperative that preoccupation with this phase should not preclude all thought for what will follow. When planning the subsequent phases, every reasonable contingency should be foreseen—even unexpected success.

3. A commander always must be prepared to exploit success, even if it has not been foreseen, and even if it occurs during the early phase of a carefully planned operation.

4. The integration of British and American forces on the corps level is by no means impracticable. In this operation, it was in no way responsible for any major shortcoming, although the landing took place during the infancy of Anglo-American co-operation in the field.

Danish Air Force Training

Digested by the MILITARY REVIEW from an article by William Green in "Canadian Aviation" (Canada) February 1951.

ALTHOUGH Denmark possesses neither great mineral wealth nor outstanding strategic harbors, her situation, in respect to the Baltic and the North Sea on the one hand, and Central Europe and the Scandinavian Peninsula on the other, combined with very convenient bases for the launching of air attacks against the British Isles, makes her acquisition extremely worth while for an Eastern aggressor.

The Danes, like their closest friends and neighbors, the Norwegians, are signatories to the Atlantic Pact, their wartime experiences having taught them that collective defense can be the only possible deterrent to aggression. Sweden, another neighbor, whose mineral wealth and extensive industry make her a valuable prize, has clung to neutrality.

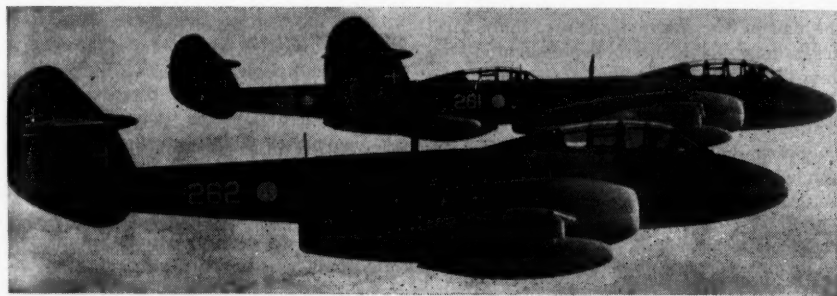
Neither Denmark nor Norway could withstand the full onslaught of an invasion from the East, for they do not possess the physical nor financial resources necessary for the launching of a rearmament program of sufficient size to build up their war potential to a safe level. It is surprising, therefore, that Sweden, Denmark, and Norway have been unable to establish a joint, integrated system of defense.

However, a feature that is common to all three Scandinavian nations is the realization that they must build up their defenses. Although Denmark's resources are limited, she is founding an air defense system that will form an integral part of the over-all defense pattern for Western Europe.

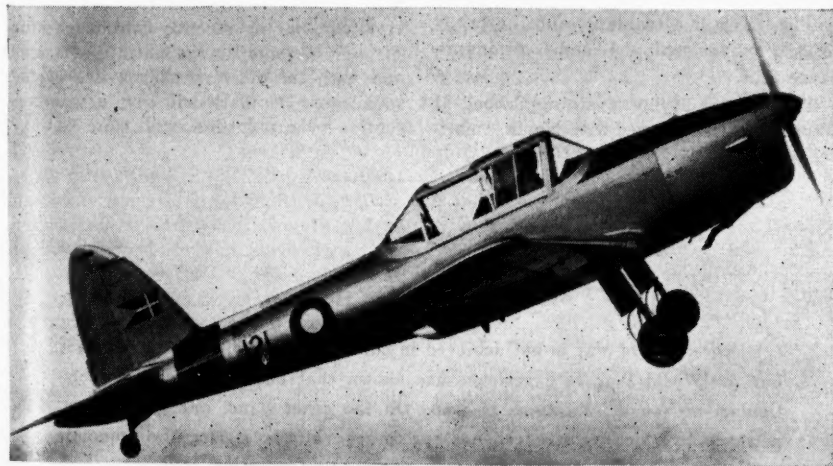
The Danes understand fully that this is the only way for them to avoid serving

again as an advance "aircraft carrier" for a determined invader. Their military leaders have taken to heart the fact that Danish airfields could accommodate *Tu-2s* and their later progeny in a future war as

and the newly founded Danish Air Force now is engaged in a 3-year expansion and modernization program which, when completed this year, will provide Denmark with an air arm that, although small, will



The Danish Air Force now is engaged in a 3-year expansion and modernization program which will provide Denmark with an efficient air arm, with equipment as modern as that of the other European Atlantic Pact signatories. Above, a trio of *Meteor Mk 7s* of the Operational Flying School. Below, a *Chipmunk T. Mk 10* used for training purposes.



easily as they accommodated *Ju 88s* in the last.

Danish air defense, until recently, comprised separate air services of both the Army and Navy. After prolonged inter-service bickering, however, the two forces were combined under a joint command,

be an efficient fighting force with equipment as modern as that of the other European Atlantic Pact signatories.

At the time of writing, military aviation in Denmark is organized mainly for training purposes, the accent being placed on jet instruction to have a pool of trained

pilots ready when she takes delivery of her five squadrons of *Meteor* jet fighters.

The Elementary Flying Training School has been equipped primarily with the nationally built *KZ II-T* monoplane since flying training was resumed in Denmark at the end of the War. However, these aircraft now have been supplemented by quantities of British-built, Canadian-designed De Havilland *Chipmunk T Mk 10* trainers. When her full order for 28 *Chipmunks* is delivered, the *KZ II-Ts* will be handed over to the flying clubs to assist in creating a reserve of civilian pilots which can be called upon in times of emergency.

The Technical Flying School, at Vaerløse, uses *Airspeed Oxfords* to provide twin-engine instruction, gunnery, and bombing training for crews who are to serve with the *Catalina*-equipped reconnaissance units used for patrol duties from Danish bases in Greenland, and the home-based *Fortress*-equipped bomber-reconnaissance unit.

The Service Flying Training School, at Skrydstrup, is equipped with North Ameri-

can *T-6* basic trainers, and the Operational Training Units at Karup, Copenhagen, and Vaerløse fly *Spitfire Mk 9s*, 40 of which were acquired at the end of the War. After a period of training on the single-seat *Spitfires*, some pilots are given a jet conversion course on the three two-seater *Meteor T Mk 7s* that were delivered to the Danes in 1949.

Other pilots are sent to Sweden for their jet training, and, by the time that their full complement of 60 *Meteor* fighters arrive, there will be plenty of Danish pilots to fly them. At present, only a small number of *Meteor* fighters have been delivered, and these are being used primarily for instructional purposes for both pilots and ground crews.

The radar umbrella that is destined to shield the whole of Western Europe, and which already stretches along a large section of the western side of the Iron Curtain, has yet to be extended to Denmark. However, having recently purchased 60 of the new 40-mm Bofors antiaircraft guns and with the delivery of her five *Meteor* squadrons, Denmark will give a warm reception to any future aggressor.

Prevention of war is not achieved in pacifism or in isolationism. In fact, our pre-World War II experience has shown that both pacifism and isolationism are open invitations to war. On the other hand, our postwar experience, in which we strengthened our forces while bolstering the economic and military potential of the Western world, has done much to prevent war.

General J. Lawton Collins

Factors in the Defense of the West

Digested by the MILITARY REVIEW from an article by Major General B. T. Wilson in "The Royal Engineers Journal" (Great Britain) March 1951.

THE democracies of the West may be slow beyond reason to arm themselves against aggression, but they are quick to form political groups against the possible aggressors. This point was brought out by Mr. Churchill in a conversation, in 1937, with Herr von Ribbentrop, the German Ambassador. The story was told in *The Gathering Storm* (page 175) and an extract is quoted below:

And I [Mr. Churchill] repeated "Do not underestimate England. She is very clever. If you plunge us all into another war, she will bring the whole world against you like last time." So then the Ambassador rose in heat and said "Ah England may be very clever, but this time she will not bring the world against Germany."

The Western world of 1950 is faced with a problem in power politics which bears a general resemblance to that which faced Great Britain and France at the time of this notable conversation; that is, how to mobilize the world against possible aggression and at the same time to make military provision for defense in event of war. However, the conditions affecting the problem are in curious contrast to those of 1937.

This time, the USSR and its satellites have evolved a system of political infiltration which has made good a greater extent of territory and secured far more adherents than ever rewarded Nazi blustering and brute force. As territory is won over, it disappears behind the Iron Curtain and "the rest is silence." The infiltration process never stops. Eastern Germany, for instance, already is in the toils, while Western Germany is being worked on, happily, so far without much visible result.

The Soviets have, at the same time, created armed forces out of all proportion to their needs for defense, not only on land and in the air, but also, most significantly, at sea. These forces are so out of proportion that any intelligent observer cannot but believe that their ultimate object is to dominate the world.

In both Europe and Asia, where infiltration is in operation, the various peoples concerned are either just beginning to recover from the crippling effects of World War II, or are still distracted with other conflicts. In Western Europe, Germany is completely disarmed and the other nations, except Great Britain, have only a fraction of the armed forces which they possessed in 1939.

However, there are, fortunately, important new factors which are favorable to the Western Powers. World War II started as a European war and only gradually spread over the entire world. If there is to be a third world war, it will start as a world conflict from the word "go," and most of the nations of the world probably will be involved in it from the very beginning on the side of the West. There will, therefore, be fewer complications and hindrances in drafting the plans for the defense of the West.

In addition to this great advantage, the United States will be in general control of the Western Powers and, situated between the Atlantic and Pacific Oceans in North America, will be far better placed to direct a world war than Great Britain, whose proximity to Europe is a disadvantage in these days of ever more powerful aircraft, the atom bomb, and guided missiles.

The United States, which has grown, quite within recent memory, to be the greatest industrial power ever known to mankind, has, fortunately for Western civilization, some great statesmen who have not hesitated to abandon the traditional isolationist policy of the New World and to take over from Great Britain the political leadership of the world. They show signs, moreover, of being able to use their powerful resources quickly, boldly, and wisely. Leadership of this kind is a signal advantage for the West.

It is against this roughly sketched background, that European statesmen have recently been considering the defense of Europe and have been discussing the existing weaknesses with ultrademocratic frankness. Although nothing has been revealed which will have come as a surprise to the absolutists of the East, they may be naively apt to conclude that the peoples of the West now realize the full weakness of their military position and that, therefore, they will be the more ready to absorb the gospel of communism.

For this excellent reason alone, it is high time that active steps were taken to create effective armed forces. It is not enough merely to be very clever at politics.

The creation of these armed forces is a complex problem—at once political, military, and technical—which already is being tackled. Provided that time permits, there is hope that something good enough to make a promising start will be produced.

But in these days of total war, the creation of regular armed force is only part of the problem of defense. There are many other activities to be attended to before the effective strength of the entire world can be brought against the possible aggressors, "like last time."

The Importance of Ideas

First of all, there is the realm of ideas: as a man thinks and believes, so he will act.

Have effective steps been taken to persuade the vast majority of the peoples of the West that the Western idea of democracy is tolerable and that the Eastern one is not? Unless great statesmen with sound governments at their backs are able to do this, there will only be apathy in the defense of the West.

Faction, that fatal sign of decay in ability to govern that ruined Rome, is a curse in many Western European democracies. In a world standing on the very threshold of a third world war, statesmen must somehow get rid of faction and unite their peoples.

Home Guards for the West?

In Great Britain there is, happily, neither any widespread belief in communism or much faction. It is probable, for instance, that if there were a call for the reconstitution of the Home Guard, hundreds of thousands of men would enroll within a few weeks. They would all be free from any taint of faction or communism, or any other 'ism: their only thought would be the defense of their country.

Few statesmen on the Continent could venture, at the present day, to arm their people in such a fashion—"Tis true 'tis pity: and pity 'tis 'tis true!" The Latin countries could do it readily enough if they were not such a prey to faction that the weapons issued might start firing by themselves like Bismarck's guns.

Curiously enough, Germany, in her long history of warfare, has a record of genuine Home Guards. On the Luneberge Heide (heath), not far from where Lord Montgomery signed the Armistice of 1945, lies the grave of a German poet who wrote of the beauties of the Heide and of the defense of the countryside by local volunteers in the Thirty Years War. The long struggles of that interminable war bore heavily on those who lived in the isolated villages of Northern Germany. Marauding armies, seeking food and plunder, roved the country like wolves and, like wolves, sheered off in the face of organized resistance.

Local volunteers of this kind, as opposed to the private armies of unreliable political or military adventurers, would be most useful to a defending army of the West. Indeed, nothing would cure the modern military disease of "infiltration" better than a reliable system of Home Guards. In good days, they would be a security against sabotage and, in bad days, they could hold local "hedgehogs" and be organized as partisans. It is, therefore, worth considering the idea of establishing Home Guards throughout Western Europe as a basis of security.

Two Important Economic Advantages

It is a matter for regret that the statesmen at Strasbourg spoke, almost entirely, of the inadequacy of the existing defense measures and neglected to draw attention to some of the long-term, but overwhelming, advantages which the West will enjoy, if a third world war is thrust upon it.

Although the Western democracies have to be "needled" into building up their defenses by brutally frank revelation of their deficiencies, it is surely unwise not to point out to the world some of the brighter features of the military picture as well. Such an omission is not only discouraging to the West, but may also mislead the East, which might judge its success in a third world war to be certain, when actually nothing could be surer than its eventual defeat.

The overwhelming advantages of the West lie, of course, in the economic field.

Apart from a multitude of well-trained and well-disciplined men, the creation of armed forces depends on steel, petroleum, chemicals, and many other raw materials. Of these, steel perhaps is the most important, as it can only be stepped up very slowly. A glance at the table below is revealing:

Country	Steel production in millions of tons per annum
United States	100
Great Britain	16
Western Europe	40
Eastern Bloc	40

Even if the Eastern bloc were able to possess the steel production of the whole of Western Europe as a going concern, which is most improbable, its steel potential even then would be less than that of the West, by an amount equal to more than twice the huge steel capacity of Great Britain.

If to this staggering advantage are added the better mass production tech-

niques of the West, and the well-proved superiority of sea transport over rail transport for long and heavy lifts, the steel position of the East is an unenviable one.

If the Soviets unhappily decide on war, one of their immediate objectives, obviously, will be to secure the coal and steel of the Ruhr and the Saar, which will become as important to them as they were to the Germans in World War II. Any Western plan of defense must, therefore, include effective arrangements for the denial of this steel production to the East. It also will be necessary to prevent the arrival of the considerable amount of iron ore which is normally required from outside sources.

In view of their weakness on the steel front, the Soviets are busy stock-piling immense quantities of tanks, trucks, and other vehicles. They also have to find the fuel oil to drive them, not to mention the ever increasing amount of aviation gasoline required to cover movements from air attack.

This brings into view another big advantage of the West which is apparent from the table below:

Production of Petroleum (Chief Countries Only—1948)

West	Million Tons		East
United States	277	30	USSR
Venezuela	70	4½	Rumania
Mexico	8		
Trinidad	3		
Columbia	3		
Argentina	3		
Persia	25		
Arabia	19		
Kuwait	6		
Iraq	3		
British Borneo	3½		
TOTAL	420½	34½	

Proved Barrels in Reserve (1947)

86 percent

14 percent

These figures show that the West has an oil production of more than 12 times as great as that of the East and that it is in the habit of holding reserves of oil which are six times as great as those of the East.

Now during the German campaigns in Russia of 1941-45, both sides disposed of hundreds of divisions, but a large proportion of these divisions had only horse-drawn transport. It is extremely doubtful whether either army could have produced the gasoline to move all these divisions with mechanical transport even if they had had the necessary vehicles. As it was, the armored and motorized divisions were in a chronic state of gasoline shortage. The long periods of inaction during the Russian final advance westward were for the most part due to the supreme difficulty of moving stores forward from railheads.

Three to four hundred modern divisions, with the increasing air support which is essential, require an amount of gasoline which for the East will prove more and more difficult to supply and transport.

To work out the measures required, not only to preserve the favorable steel and oil advantages enjoyed by the West, but also to add to them, is a task of the first magnitude, which gives scope for genius. If they can be even maintained, their influence is bound to be decisive.

A Plan for the Future

Behind the Iron Curtain there are probably frictions, discords, and human miseries before which those of the West pale into insignificance. If, in spite of their fervent protestation in favor of peace, the rulers of the USSR were to order their armies to march into Western Europe, it is by no means certain that the Soviet soldiers would do so with great enthusiasm. This is true especially at the beginning when the Russian soldier, judging by past wars, seems to be slow to perceive the essentials of combat and takes time to develop his great powers of fighting.

It is, therefore, important, at an early stage, to possess morale weapons to work on the minds of the Soviet troops, as well as those which act more immediately and directly on their bodies. In any event, trial and tribulation come to all soldiers and would come in aggravated form to those of the Soviets, because, in the end, they would be totally defeated.

This being so, it is essential to have, from the very beginning of the struggle, some rough but clear plan for the future of the USSR and its satellites to which all action can be related, and on which assaults on the morale of the Soviet soldiery and peoples can be based. Furthermore, it is not reasonable to contemplate the destruction of the machinery of government of a whole continent without, at least, having a rough idea of what is to be set up in its place.

When the Germans marched into Russia in 1941, they had, at first, very great successes, but they had no clear idea of what they were going to offer the Soviet peoples, although they could have bestowed most compelling benefits. They had been taught by Hitler that all Eastern peoples were "subhuman" and fit only to be slaves. This attitude, and the lack of a plan for the future of the USSR, may have contributed greatly toward their loss of the Russian campaign. The Soviets reacted fiercely against the first, and, in the absence of the second, gradually became as imperial in their outlook as the Russia of the Czars, and far more formidable.

The Western world must profit by the lessons of the past and not make such colossal mistakes a second time. The future of the USSR is, of course, an Eastern problem and can only be solved by the East with the aid of the West. There is no quarrel with the Russian people who are as helpless to decide whether it is to be peace or war as is the West itself. In the present welter of events, the world would welcome with joy the emergence, in Russia, of a great leader capable of evolving

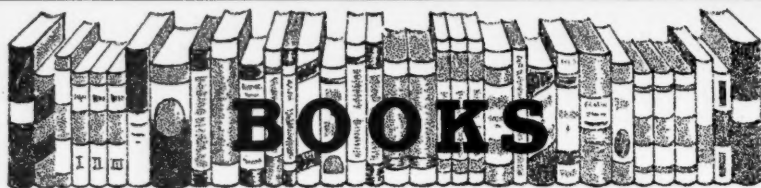
and putting into execution a plan for guiding communism on to a better road than it is following at present. However, whether such a leader appears or not, there must be some sort of plan for the future of the USSR, if the West is to enter a possible conflict.

No thoughtful person can but be appalled that the world situation has deteriorated so quickly and so profoundly as to require serious consideration, in peacetime, of plans for radical changes in the

government of a former great Ally, without whose long enduring heroism World War II might have continued for another decade. Only 5 years ago, the civilized world, though shattered, was full of hope that the Allies, having won the War, would get together and win the peace. It might have been done and could still be done, for a change of heart works quickly. Until signs of it show themselves, the West has no possible course of action but to take all possible steps to defend itself.

If our strategic plans are to be most effective, they must be designed to exploit the full range of capabilities of new developments. Conversely, our research and development plans must stress those developments which will best support our contemplated strategic operations. In effect, the strategic planners determine *what* we will do and *how* we will do it. The research and development planners must provide superior means which assure the successful execution of those strategic plans.

Major General Charles G. Helmick



FOR THE MILITARY READER

BATTLE SUBMERGED: Submarine Fighters of World War II. By Rear Admiral Hartley Cope, USN-Ret, and Captain Walter Karig, USNR. 244 Pages. Illustrated. W. W. Norton and Company, Inc., New York. \$3.75.

By COL PAUL W. STEINBECK, *Arty*

Battle Submerged describes the extraordinary versatility of what the authors declare will be the most important fighting craft in the next war—the submarine.

It reveals the vital role played by submarines in the defeat of Japan. While the amount of Japanese shipping sunk by submarines could not be publicized during the War for security reasons, full credit is given in *Battle Submerged* to this sea arm.

The authors indicate the capabilities of undersea craft and the crews that man them by stories based on official Navy files and interviews with personnel who were there. They maintain a running commentary on each exploit, interspersed by direct quotations from submarine logs and other official records.

Illustrations of its versatility included many uses of the submarine for which it was not designed, and other uses which were not planned but were developed during combat. For example, the submarine proved useful for reconnaissance including offshore photography and liaison with guerrilla forces. They delivered troops into combat on raid missions, supported them by fire, and withdrew them when the mission was accomplished. They also performed many other missions such as mining and rescue work.

The human interest touch is included in the many heroic sacrifices made by the men of the "Silent Service." The everyday life and vicissitude of undersea service is intimately portrayed.

While the stories deal with World War II type submarines, the authors, through their knowledge of submarine warfare and new developments of undersea craft, make interesting predictions of the role of the submarine in future naval warfare.

HAWAII'S WAR YEARS, 1941-45. By Gwenfread Allen. 418 Pages. Illustrated. University of Hawaii Press, Honolulu, Hawaii. \$5.00.

THE BEGINNINGS OF POLITICAL DEMOCRACY IN JAPAN. By Nobutake Ike. 246 Pages. The Johns Hopkins Press, Baltimore, Md. \$3.50.

THE UNITED STATES AND SCANDINAVIA. By Franklin D. Scott. 359 Pages. Harvard University Press, Cambridge, Mass. \$5.00.

THE SOVIET AIR FORCE. By Asher Lee. 207 Pages. Harper & Bros., New York. \$2.75.

NATURAL REGIONS OF THE U.S.S.R. By L. S. Berg. Translated from the Russian by Olga Adler Titelbaum 436 Pages. The Macmillan Company, New York. \$10.00.

SOVIET-IMPERIALISM: Russia's Drive Toward World Domination. By E. Day Carman. 175 Pages. Public Affairs Press, Washington, D.C. \$3.25.

THE NEW SOVIET EMPIRE. By David J. Dallin. 216 Pages. Yale University Press, New Haven, Conn. \$3.75.

By COL GEORGE C. REINHARDT, *CE*

If the threat of Communist aggression is a revival of Czarist imperialism, an inexorable necessity for new conquests to maintain the mantle of invincibility which alone diverts a resentful populace, policies for Western defense may be mapped accordingly. But should today's threat stem from a national peoples' movement, a tide of Russians seeking *lebensraum* like the barbarian invasions of Europe's history, the course of defensive action must be different.

David Dallin, acknowledged historian of Russian politics and government with an impressive record of correct forecasts on Russian political behavior, presents a credible case for the former theory. Simultaneously, he warns the United States of the disaster lurking in policies directed against the latter. Assessing Soviet strength, its perfection of totalitarianism beyond anything attained by the Nazis, Dallin asserts: "Below the surface, the rot at the heart of the Communist state begins."

Differentiating between "devotion" and "loyalty," the author regards the Russian people as too intelligent to be deceived; too weary and impotent to rebel. They wait for help from the rest of the world in their consuming longing for relaxation; a "life in which the average human can live decently."

Dallin terms "aid to communism" the contention that the Russian people do not object to their lot; but their "backwardness dictated the Communist course of action." The chapter entitled "Once Again Inferior Races" is written in a satirical manner that, on a subject less vital than this life-and-death stake, is delightful reading. The substitution of "diaperology" for scientific anthropology in explaining

the "peculiar traits of Soviet policy" by American and British supposedly scientific groups is neatly disposed of with quotes from similar "authorities" finding that "American men's addiction to milk as a drink" is erotic and leads to American isolationism! Racial approaches to national policy can, Dallin insists, end only in disaster like Hitler's myth of "nordic supremacy."

Two chapters present completely novel concepts of Stalin's difficulties in reconciling his new imperialism and his postwar aggrandizement of Great Russian (as distinct from Soviet Russian) nationalism, with the Marxist-Leninist thunders against both nationalism and imperialism. An illuminating example is the instance of Soviet Marshal Rokossovsky becoming Poland's Minister of Defense and most powerful official in that Communist satellite. Where old Czarist Russia would have dispatched a "Governor General" to Warsaw, Josef Stalin secretly must compel Poland's President to "request the Soviet to place the marshal at the disposal" of the conquered—but not openly annexed—nation. The death, or purging, of Rokossovsky would renew the dilemma. There is no legal means of providing a Russian emissary to succeed him in a post, the control of which the Politburo rightly regards as essential.

The Iron Curtain, Dallin states, is the desperate effort of the Kremlin to conceal its lies from the Russians; to prevent the world from learning that Politburo boasts and posturing are frequently without foundation. He concludes with an appeal for a "pro-Russian anti-Communist policy for the West" as a program militarily and politically sound. Neither a peace campaign nor a war can be won if, like Hitler, Western policies alienate the Russian people and drive them back to support Stalin as the lesser of two evils.

THE PEOPLE OF GREAT RUSSIA: A Psychological Study. By Geoffrey Gorer and John Rickman. 236 Pages. Chanticleer Press, Inc., New York. \$3.00.

By CAPT RICHARD H. HANSEN, *Arty*

This book is divided into two sections. The first section entitled "Russian Camera Obscura" presents 10 sketches of Russian peasant life by Dr. John Rickman. The second section written by Geoffrey Gorer is entitled "The Psychology of Great Russians."

The 10 sketches presented in the first section give the reader varied glimpses into the life of the peasant and attempts to account for the Russian ways of thinking and reasoning which are so strange to the Western world.

One of the most noticeable traits is the absolute conformity of all the people who live in one community. All must feel and act as one or they are considered as being outside of the "circle of intimacy." It is Dr. Rickman's contention that the Russian people think and act as one, and anyone who has broken from this circle is in misery until he is accepted again into the group.

Mr. Gorer furthers this trait and the deep feeling of guilt and hostility that is imbedded in the mind of the peasant through the practice of swaddling of the infant. The fact that the child, except for the feeding by the mother, may be cared for by any other member of the family (which often consists of three generations), as well as any other member of the community, accounts for the close feeling among the members of each community.

Mr. Gorer believes that the constraint through swaddling of the infant is a factor which produces the silent hostility and indifference to physical suffering which characterizes the Russian peasant.

While the book provides interesting insights into the life of the Russian people, it is of limited value to the average military reader.

APPEAL TO ARMS. By Willard M. Wallace. 308 Pages. Harper & Brothers, New York. \$4.50.

By LT COL DONALD T. KELLETT, *Inf*

While it is doubtful that the author, a wartime officer and currently an assistant professor at Wesleyan University, Connecticut, has unearthed anything new concerning the American Revolution, he has succeeded in compiling a complete chronicle of military operations of that period. The volume will be useful to the military student in dispelling those commonplace illusions predicated upon patriotic legend.

Wallace convincingly relates how a small but efficient British professional army, time and again, let victory slip from its grasp through failures of co-ordination, apparent indifference by the higher commanders, and a surprising lack of clearly defined objectives.

Nor were the Continentals and colonial militia above reproach. While outnumbering their adversaries several times, the Americans succeeded only after the French intervened and neutralized British seapower with a sizable fleet.

Of particular interest is the attitude of the civilian population, torn between conflicting loyalties and profiteering motives. Any military reader who expects to participate in the complexities of modern politico-military activities in foreign lands will do well to refresh himself on the attitude and deportment of the American people at the time this Nation was invaded by the British and their mercenaries. This text will provide an excellent medium for such a purpose.

POLITICAL TRIALS AND ERRORS. By Lord Hankey. 150 Pages. Henry Regnery, Chicago, Ill. \$2.50.

An analysis of the "unconditional surrender" policy of World War II, and the war-crimes trials.